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THE VALUE OF VARIOUS GAMES AND ACTIVITIES IN TEACHING SPELLING

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THE purpose of this experiment is to compare the interest and ability in spelling developed by a program devoted partly to spelling games, puzzles, problems, work with words, directed word activities, etc., with a program based almost exclusively upon direct study of word lists by the familiar study-test and test-study plans.

Subjects.—Thirty-eight classes totaling 1565 pupils from Grades 2 to 8 inclusive in Public School 232, Brooklyn, New York, of which Mr. Frederick B. Graham is principal, served as subjects in the study.

Method used by Control Group.—By the control groups will be meant those using the test-study or study-test plan which was employed in the school before the experiment was begun. The classes using each of these plans are indicated by entries in Table I. In general, these plans are similar to others in common use under these designations. Both are characterized by the fact that the pupils spend all their time (except that devoted to testing) in studying the list of words comprising the assignments under the supervision of the teacher. The pupils used notebooks to keep lists of misspelled words. No homework was allowed.

METHODS USED BY THE EXPERIMENTAL GROUP

The groups using the various games and word-work activities were designated the Experimental Groups. To provide a fairly representative test of this type of program, two different printed courses were used. Each was selected by a group of persons (including the two authors) as representing the best of modern programs of these sorts. We shall designate these two programs as A and B. Program A was

used in Grade 2A, B in Grade 2B, A in 3A, B in 3B and so on, alternately. Following are examples of the devices most frequently used in these programs along with the study of lists of words:

1. Writing words at the desk to tell what pictured objects and actions are.
2. Writing in words omitted in sentences.
3. Making words out of letter cards.
4. Spelling matches.
5. Writing words beginning with *ch*, *wh*, etc., or ending with *ing*, *er*, etc.
6. Word races; writing as many words as possible containing a given number of letters, or that have a stipulated type of meaning, etc.
7. Complete such words as fr–g, sto – –, ch – – – – en, etc.
8. Group or individual contests on various lists of words.
9. I am thinking of a word beginning with *b*, etc.
10. Writing in word which gives the meaning of a phrase: – – – – (not well).
11. Rearrange letters to make a word: n – a – v – i
12. Crossword puzzles.
13. Fill in letters when first and last are given. r – – – – – – d.
14. See how many names you can write for this picture.
15. Flash cards: words written on cards and flashed for opponent to recognize and spell.

INSTRUCTIONS FOR BOTH GROUPS

Teachers were instructed to adhere rigidly to the time allotments which were prescribed for each class. The periods were always identical in length for the corresponding classes in the Control and Experimental groups, but varied with grades. The minimum period was 20 minutes; the maximum 45. Most periods were near the minimum.

The teachers were instructed to say nothing about homework, that is, neither to encourage or discourage it. The mimeographed instructions on this point were: "One test of the methods will be the normal and natural carry-over. If children take their books home to study, well and good! But say nothing about it. Make sure of this!"

The experimental teaching period comprised fifteen consecutive weeks.

ASSIGNMENT OF CLASSES TO EXPERIMENTAL AND CONTROL GROUPS

In most of the grades in this school, the pupils are classed on the basis of mental ability, as determined by standardized tests. Classes

were assigned to the experimental and control groups so as to give the nearest possible approach to equivalent groups.

TESTS OF INITIAL SPELLING ABILITY

A test was made up of 100 words selected at equal intervals from those to be studied by each class during the fifteen weeks of the experiment. These tests were given by the teachers. Each teacher gave half the list to her own class and her control class, so that both of the comparable groups had the same test experience. On the bases of the scores of this test, the pupils whose records were complete at the end of the study were paired. All unpaired cases were discarded.

FINAL TESTS

To determine the effects of instruction, two tests were used. One was the repetition of the 100 word initial test which measured the extent to which the pupils mastered the words studied during the fifteen weeks of the experiment. The other was the Modern School Achievement Test in Spelling, which is composed of 74 words from all grade levels, from two to eight, inclusive. This test should reveal the effects of instruction on spelling ability in general.

RESULTS

The results of the study are given in Table I. The rigid method of pairing, on the basis of initial spelling scores, reduces the number of cases from the original total of 1565 to 1076, equally divided between the two groups.

The results are obviously inconsistent. On the basis of the 100 studied words test, the control or direct-list study methods show a numerical advantage in five groups; the program including games and devices excels in four and the two are equal in three comparisons. The results are especially inconsistent in Grades 2A to 4B. From 5A to 8A, the games and self-directed devices tend to gain the advantage, but the differences are so small as to be insignificant and so irregular as to be unreliable. The Modern School Achievement Test shows essentially the same results. In general, then, when Methods A and B are combined and compared with the direct-list-study procedure, it appears that both produce about the same degree of gain in spelling ability. It may be noted that Program B of games and devices tends to appear at a disadvantage, whereas A shows an advantage in comparison with the direct study pro-

TABLE I

COMPARISONS OF PROGRAMS OF GAMES AND DEVICES WITH DIRECT STUDY OF WORDS IN LISTS

	Experimental Method – Class Averages						Control Groups – Averages						Advantage in Favor of Experimental			
Grade	No. of Cases	Program	Initial	Final	F-I	MSA Test	No. of Cases	Method Used	Initial	Final	F-I	MSA Test	100 Word Test	S. D. Diff.	MSA Test	S. D. Diff.
2A	25	A	5.8	69.9	64.0	6.6	25	Test-study / Study-test	5.8	68.9	63.1	6.3	1.0	3.6	.3	0.8
2B	29	B	43.9	90.8	46.9	13.7	29	Study-test	43.9	97.7	53.8	15.4	—6.9	3.3	—1.7	1.0
3A	31	A	42.4	96.0	53.7	17.9	31	Study-test	42.4	93.1	50.8	18.3	2.9	3.0	— .4	1.2
3B	33	B	61.2	89.9	28.6	28.9	33	Test-study	61.3	95.2	33.9	35.2	—5.3	3.3	—6.3	1.8
4A	29	A	70.2	97.3	27.1	32.8	29	Test-study	70.2	97.4	27.2	34.9	— .1	3.5	—2.9	2.1
4B	23	B	57.7	96.9	39.2	42.9	23	Study-test	57.7	98.7	41.1	44.0	—1.8	4.1	—1.1	2.2
5A	39	A	77.7	97.0	19.3	49.9	39	Study-test	77.7	94.9	17.3	46.5	2.1	3.4	3.4	2.0
5B	39	B	78.9	96.9	18.2	53.7	39	Test-study	78.7	93.7	15.1	53.4	3.2	3.2	.3	2.1
6A	37	A	86.2	98.3	12.0	61.2	37	Test-study	86.2	98.3	12.1	60.7	——	3.8	.5	2.3
6B	17	B	70.0	97.1	27.1	62.2	17	Study-test	70.0	94.9	24.9	59.8	2.2	4.6	2.4	2.8
7A	129	A	81.3	95.2	13.9	67.4	129	Test-study / Study-test	81.3	95.2	14.0	67.7	——	2.4	.3	1.4
8A	107	B	74.4	93.6	19.2	70.4	107	Test-study / Study-test	74.4	93.4	19.0	69.9	.2	2.3	.5	1.5

gram in the lower grades (2A to 5A) whereas Program B tends to exceed the direct study and Program A merely to equal it in the upper grades. On the whole, it was the opinion of the teachers that Method B offered instructions and activities which were a little too complex and involved in the lower grades. If these instances are eliminated, it appears that the program including games and devices conducted according to directions contained in the materials tends to produce at least equal and perhaps, on the whole, slightly greater gains in ability than does the plan which confines itself strictly to study of the words.

TABLE II

A Summary of the Pupils' Reactions to Two Questions: (A) Which Method Do You Prefer? and (B) Which Method Do You Think Helped You Most in Learning To Spell?

Grade	Program	Interest		Efficiency	
		Exper.	Control	Exper.	Control
8A3	B	36	4	36	5
8A5	B	36	4	35	5
8A7	B	35	2	35	2
7A6	A	22	16	20	18
7A1	A	33	6	30	9
7A4	A	22	10	14	18
7A6	A	33	1	33	1
7A2	A	38	2	37	3
6B1	B	36	4	33	7
6A2	A	41	4	39	6
5B2	B	33	3	32	4
5A1	A	45	2	45	2
4B1	B	31	4	28	7
4A2	A	45	2	47	2
3B2	B	34	0	29	5
3A1	A	37	5	40	2
Total		557	69	533	96

PUPILS' REACTIONS TO THE METHODS

After the completion of the final tests, the pupils who had used the game and activity supplements to the drill program and who had previously used the method confined to direct study were asked to tell: (a) which method they preferred, and (b) which method they thought helped them more in learning to spell.

The results of the pupils' reactions to these questions are given in Table II. The vote was emphatically in favor of the programs in which games and word devices as well as drill were employed. Approximately 89 out of each hundred found this method more interesting and about 84 out of each hundred believed it to be more efficient. It may be seen from the table that the votes were similar at the various grade levels and for the two programs, A and B.

Due to the possibility that the pupils may have tended to favor the method then in use, either due to familiarity with it or to a notion that the method used by the teacher was the method to favor, a similar vote was held about six weeks later. During these six weeks most of the children had been using the direct-list study of control method. Most of them were also under a different teacher as the result of mid-year promotions.

Since the pupils were scattered through many rooms at this time, it was difficult to locate them all and to assemble the data under the original class designation. Votes were obtained however from 580 pupils with the following results:

TABLE III

A SUMMARY OF THE REACTIONS OF PUPILS TO THE TWO METHODS OF STUDYING SPELLING EMPLOYED IN THIS INVESTIGATION SIX WEEKS LATER

	Experimental Method	Control Method
Like better	370 = 64%	210
Learn more	336 = 58%	244

The preference for the game and device program has shrunk from 89 percent to 64; the vote on efficiency from 84 to 58. The majority, however, continued to prefer the game and device program, and believed they learned more by it.

TEACHERS' JUDGMENTS

Each teacher who had used both methods was also asked to give her opinions concerning: (1) which method was easier to handle, (2) which she believed gave better results, and (3) which seemed to be more enjoyed by the pupils. Most of the teachers gave not only a categorical answer to these questions but also an illuminating discussion of the merits and limitations of the two general plans. A tabulation of the direct answers appears in Table IV.

TABLE IV

TEACHERS' JUDGMENTS CONCERNING THE TWO METHODS

	Favor Experimental	Favor Control	Equal
1. Ease of teaching	8	5	3
2. Efficiency of method	8	3	5
3. Most interesting to pupils	12	0	4

Half of those who had used the experimental program found it easier to teach and believed it to be more efficient than the direct-drill method which they had used before, and the other half either experienced no dif-

ference or favored the direct-drill method. Seventy-five percent believed their pupils showed greater interest in the experimental method and a quarter found the two procedures equal. No teacher declared that the direct-drill procedure was more interesting to the pupils.

The teachers' discussions of the methods brought out a number of agreements on certain points. One was the belief that the game and activity programs, which were largely conducted by means of directions read and executed by the pupils themselves, were better suited to bright or advanced pupils than to slow and retarded pupils. One of the programs especially seemed to be pitched so high in complexity as to be difficult for slow and even average pupils in the lower grades. Thus, many teachers declared that the book-directed-activity program was better for, and more interesting to their brighter pupils, but that it was less satisfactory than the direct-test study or study-test program for the less able pupils. Many teachers also remarked that slow pupils following the book-directed-activity program spent so much time finding out what to do and doing it that they had too little time left for studying spelling.

In order to secure evidence concerning this point, the data for the pupils were reassembled on the basis of spelling ability into three groups, namely, lowest, intermediate and highest. The data for the lowest and highest thirds are compared in Table V. In order to secure more reliable groups, the pupils in the two halves of each grade were combined up to and including grade 6 and the data for 7A and 8A were likewise pooled.

Table V shows that, although the differences between the two methods are neither very great nor reliable, the tendency is in the direction suggested by the teachers. The poorer spellers tended to get better results from the method which devoted the whole time to direct test and study of the word lists, and the best spellers tended to show greater gains when the book-directed program including study of words and various games and activity was employed. Computations made for another purpose show that the poorest third in spelling were also, as a group, lowest in intelligence test scores and the best third in spelling were highest in intelligence test scores.

The above data are insufficient to show the causes of the appearance that the groups lowest in spelling and intelligence test scores find the book-directed-game-activity-and-word-study method less productive of

TABLE V

COMPARISON OF TWO METHODS FOR BEST AND POOREST SPELLERS SEPARATELY*

	Grade	Experimental Method					Control Method					Advantage in Favor of Experimental			
		No. of Cases	Initial Score	Final Score	F-1	M. S. A. Test	No. of Cases	Initial Score	Final Score	F-1	M. S. A. Test	100 Word Test	S. D. Diff.	M. S. A. Test	S. D. Diff.
Less Able Pupils	2A, 2B	18	8.3	55.2	46.9	7.8	18	8.2	57.2	49.0	7.8	—3.1	4.0	0	——
	3A, 3B	21	31.2	82.4	51.2	12.2	18	31.2	85.6	54.4	12.4	—3.2	4.2	—0.2	1.8
	4A, 4B	17	33.7	88.9	55.2	14.5	17	33.6	89.0	55.4	14.6	—0.2	4.5	—0.1	2.3
	5A, 5B	26	48.5	90.0	41.5	18.6	26	48.4	91.2	42.8	18.4	—1.3	4.4	+0.2	2.3
	6A, 6B	16	54.3	89.3	35.0	24.5	16	54.3	90.4	36.1	24.6	—1.1	4.8	—0.1	2.7
	7A + 8A	75	63.0	90.1	27.1	36.8	75	63.1	90.0	26.9	37.1	+0.2	2.4	—0.3	2.5
More Able Pupils	2A, 2B	18	20.2	85.3	65.1	11.5	18	20.2	82.1	61.9	11.6	+3.2	4.1	—0.1	1.4
	3A, 3B	21	65.5	96.6	31.1	20.4	18	65.5	97.5	32.0	20.9	—0.9	4.6	—0.5	1.8
	4A, 4B	15	68.4	95.6	27.2	32.6	17	68.4	92.4	24.0	34.2	+3.2	4.8	—1.6	2.2
	5A, 5B	26	85.4	98.8	13.4	50.1	17	85.4	96.2	10.8	49.1	+2.6	3.8	+1.0	2.4
	6A, 6B	16	86.2	99.2	13.0	66.5	16	86.3	98.1	11.8	65.9	+1.2	3.6	+0.6	2.6
	7A + 8A	75	82.3	98.5	16.2	71.4	75	82.3	98.8	16.5	72.2	—0.3	2.0	—0.8	2.0

*Each Experimental Group included pupils using Programs A and B, and each Control Group included pupils using both study-test and test-study methods.

spelling gain than did the groups highest in spelling and intelligence test scores. The following are some of the possible explanations.

1. Since the pupils had previously used the word-test-and-study or word-study-and-test method exclusively, it is possible that the differences shown in Table V are due to the greater ability of the pupils superior in spelling and intelligence test scores to adapt themselves to the new method.
2. It is possible that the book-directed-activity programs were more suited in level and complexity to the pupils in the highest third in spelling and intelligence. It is therefore possible that the use of more suitable material would have produced similar results for the lowest third.
3. It is possible that the book-directed-study-and-activity program is intrinsically more difficult for and unsuited to the lowest third.

A tabulation of preferences showed that of 182 pupils in the lowest third whose records were available, 109 or 60 percent liked the book-directed-study-and-activity program better and 93 or 51 percent thought they learned more by its use. Of the 185 records from the other group, 129 or 70 percent liked this program better, and 124 or 67 percent believed it to be more efficient.

Probably the only general conclusions to be drawn from the results of the study are: (1) that the two methods increase spelling ability in roughly equal degree, but that the book-directed programs combining word study with word games and other activities are more interesting under the conditions of the study, and (2) that the two programs of the word study and game type used in the study were relatively slightly more successful with the third of the pupils highest in spelling and intelligence test scores than with the third lowest in these respects.

AN EVALUATION OF DIFFERENCES IN TEACHING ABILITY

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Of all the factors entering into the process of education, teaching ability has most stubbornly refused to submit itself to objective evaluation. Reasons for this are at least two in number. In the first place, we have not been able to agree upon the functions and importance of the classroom teacher, *per se*, either in general or in connection with instruction in particular fields at definite levels. Moreover, such evaluation may be relatively unimportant since it has been said that "there is reason to doubt whether the differences between the very best and the very poorest teachers of a school system are half or even a quarter as important in determining the accomplishments of the pupils as are the differences in endowment as revealed by mental tests".[1] The best we seem to have been able to do in this regard is to select a few more or less vague generalities on the basis of which we make our estimates of classroom efficiency. But there stands also a second obstacle, related to the first, in the path of an objective treatment of this efficiency. Assuming that we have sharply defined the features of the teaching act upon which we are to base our judgments, we still lack a meaningful numerical scale upon which to locate these judgments. We may take any one of a number of teacher-training scales, and, using it, get for a particular teacher a total of, say, 155 points out of a possible total of 250. One hundred and fifty-five what? No one knows.

It would seem, then, that whatever method of rating is employed, the results must be capable of interpretation in terms of units already defined and generally understood. In the vocabulary of educational measurement, no unit is so frequently used as mental age. Why not, then, use mental age—of students, to be sure—as a basis for a scale of teacher-rating? Terman[2] has stated the problem thus: "...if inequalities of forty points in intelligence cannot be counterbalanced by reversed inequalities of teaching, how much intelligence quotient *can* be wiped out? Is it thirty points, or twenty, or ten, or even less?" For the purposes of the study described in the following pages, the problem has been restated to read: What is the mean increment of mental age necessary in order

[1] Terman, L. M. "Possibilities and Limitations of Training," *Journal of Educational Research*, X (1924), page 338.
[2] *Ibid.*, page 339.

that a student of the less able of two teachers may achieve on the same level as a corresponding student of the better teacher?

The data necessary for this study are used through the courtesy of Dr. P. J. Rulon of the Harvard Graduate School of Education. The details of Dr. Rulon's investigation may be found in his recent publication, *The Sound Motion Picture in Science Teaching.*[3]

The present problem resolves itself into two parts. First it is necessary to establish that a difference exists between the teaching abilities of two or more teachers. Then it is possible to proceed to an evaluation of this difference in terms of the mental ages of the students to whom instruction has been given by these teachers. For this purpose, two general science teachers, to be known hereinafter as A and Z, were chosen from a group of seven on the staff of one of the school systems coöperating with Dr. Rulon. It is well to note in passing that the students of these two teachers formed a part of the control group, the moving pictures not being used in their course of instruction. Teachers A and Z had previously been rated best and poorest of the seven, respectively, by superintendent, principal, and supervisors. The reason for selecting the two teachers apparently most divergent in ability is immediately obvious.

In order to get some objective validation of these subjective estimates of relative teaching merit, use was made of the scores made by students on the Ruch-Popenoe General Science Test, administered at the outset of Dr. Rulon's program. Certain objections may be raised concerning the use of this criterion. It may be argued that achievement on objective tests is not a complete and adequate measure of teaching ability. This is admittedly true; but such achievement does represent the teacher's success in fulfilling a part, at least, of her teaching duty. Moreover, no other single measure is at hand which seems a fitting substitute for the one that has here been used. A second objection to the criterion may be that though a difference is demonstrated it is not known how much of this difference is due to a scientific background on the part of one group of students, had before this group entered upon a study of general science, and not shared by the other group. This objection must be dealt with on the basis of certain circumstantial evidence. In the first place, the initial groups, to be considered presently, were composed entirely of girls; whose scientific backgrounds are notoriously inadequate at best. Secondly, the

[3] Rulon, P.J. *The Sound Motion Picture in Science Teaching.* Harvard Studies in Education No. 20. Cambridge, Massachusetts: Harvard University Press, 1933.

individuals composing these groups were taken from several recitation classes, eliminating the possible influence of any homogeneity of grouping. Finally, differences shown by the Ruch-Popenoe test were maintained on the Rulon test, given at the end of the six weeks experimental period, and covering material definitely prepared so as to be unfamilar to the students.

To proceed with the problem, two groups of 73 girls each were selected from among the students of the two teachers. It is obvious that a group of 73 students could not be taken from a single recitation class. But it seems a fair assumption that a teacher's methods are so alike in all sections of the same course that errors arising from this source can be considered negligible. In preparing the two groups, chronological ages and Terman scores were matched, individual by individual, while science scores were left free. The nature of the distributions of the controlled factors may be seen in Table I. It is to be noted that the means of the chronological ages are practically the same, as are the means of the Terman scores. In as much as the variations of the distributions by pairs are also practically identical, it is possible to say that mental age has been eliminated as a differentiating factor.

TABLE I

MEAN CHRONOLOGICAL AGES AND TERMAN SCORES FOR TWO GROUPS OF 73 GIRLS EACH

Teacher	No. Cases	Mean C. A. in months	S. D.	Mean Terman Score	S. D.
A	73	174.91	7.42	86.56	26.9
Z	73	175.21	6.87	86.42	27.5

The progress in general science made by these two groups as measured by the Ruch-Popenoe test is summarized in Table II. It was found that students of Teacher A scored on the average 2.94 points higher than did students of Teacher Z. The difference between the medians is 2.95, and favors the students of Teacher A also.

TABLE II

MEAN AND MEDIAN SCORES FOR EACH OF TWO GROUPS OF 73 GIRLS EACH ON THE RUCH-POPENOE GENERAL SCIENCE TEST

Teacher	Mean	S. D.	S. D.m	Median
A	20.11	5.97	0.70	19.50
Z	17.17	5.29	0.62	16.55

Difference of Means = 2.94

Critical Ratio of Difference = 4.2[1]

$r_{m_A m_Z} = .44$

[1]The Critical Ratio is equal to a difference divided by the standard error of that difference. The standard error of a difference is computed by the formula

$$S.D._d = \sqrt{\sigma_1^2 + \sigma_2^2 - 2r_{12}\sigma_1\sigma_2}$$

At this point the actual magnitude of the observed difference is not so important as is the certainty with which this difference exists. The table above indicates that the difference between the means is 4.2 times as large as its standard error. This means, in terms of probability, that the chances are greater than 999 out of 1000 that on repeating this experiment under similar conditions the obtained difference would fall in the same direction; that is, in favor of Teacher A. It is clear, then, that as far as student achievement prior to the experimental period is concerned, Teacher A is definitely superior to Teacher Z. It remains to be seen whether this difference is maintained during a period of somewhat controlled study, the six weeks of Dr. Rulon's investigation.

In Table III are given the mean and median results of these same two groups on the Rulon test, a test especially prepared to cover the experimental period. It will be noted that here also Teacher A has been more successful. In this instance, the chances are greater than 99 in 100 that the obtained difference lies in the true direction.

TABLE III

MEAN AND MEDIAN SCORES FOR EACH OF TWO GROUPS OF 73 GIRLS EACH ON THE RULON SCIENCE TEST

Teacher	Mean	S. D.	S. D.m	Median
A	31.73	18.10	2.12	28.95
Z	26.21	16.35	1.91	22.05

Difference of Means = 5.52

Critical Ratio of Difference = 2.9

$r_{m_A m_Z}$ = .56

It would appear to be clear in view of the evidence, subjective and objective, that has been adduced that Teacher A is definitely the better of the two. But before turning to the second part of the problem, there are certain interesting observations to be made concerning the nature of the two sets of distributions that have just been discussed. Taking either of the tests, it will be noted that the differences between the two means and the two medians are numerically approximately the same; and the standard deviations are strikingly similar also. These considerations point to the fact that the pairs of distributions of achievement scores are of much the same general contour, the difference being that scores for Teacher A are uniformly advanced over those of Teacher Z. Providing the explanations for this situation is not a purpose of this paper. But it does seem likely that these explanations are to be found in those activities of the teacher which tend to affect all members of a class in much the same

fashion. Such may be motivation, general standards of accomplishment, methods of conducting group study, *et cetera*.

Having demonstrated a substantial difference in the abilities of the two teachers, it is possible to proceed to an evaluation of this difference in terms of the chosen unit, the mental age of students. Two groups of 107 pupils each were prepared by holding Rulon Science Test scores and chronological ages constant. In preparing these groups it was found impossible to control sex and at the same time have groups of acceptable size. It was found, however, that in the case of other comparisons not reported in this paper sex differences were practically negligible in this subject field in this particular school.

Mean chronological ages and Rulon scores for these two groups are given in Table IV. It will be seen that as far as these two characteristics are concerned practically identical groups have resulted. The mean chronological age is about 175 months, and the mean Rulon score about 32 points.

TABLE IV

MEAN CHRONOLOGICAL AGES AND RULON TEST SCORES FOR TWO GROUPS OF 107 PUPILS EACH

Teacher	No. Cases	C. A. in Months	S. D.	Rulon Scores	S.D.
A	107	175.59	7.71	31.81	19.4
Z	107	175.39	7.29	31.91	19.5

Turning to Table V, it is found that the mean Terman score for the pupils of Teacher A is 92.44, and for Teacher Z, 96.74, a difference of 4.30 points. The same phenomenon that was previously noted appears here also; the two distributions are very much alike in shape, one being uniformly advanced as compared with the other.

TABLE V

MEAN TERMAN SCORES FOR TWO GROUPS OF 107 STUDENTS EACH

Teacher	Mean Score	S. D.	S. D.m
A	92.44	30.4	2.94
Z	96.74	30.2	2.92

Difference of Means = 4.30

Critical Ratio of Difference = 1.6

$r_{m_A m_Z} = .57$

At the age of the students in question, 4.3 points of Terman score are equivalent to about three months of mental age. The conclusion, then, with regard to this particular case is that the differences in teaching

abilities is equivalent to about a quarter of a year of mental growth on the part of the students. In specific terms what this statement means is this. Teacher A is so much more capable than Teacher Z that students of Teacher A may be a quarter of a year retarded in mental age and yet perform as well as corresponding students of Teacher Z. The added ability of Teacher A can do the same thing for his students as would the giving them what would amount to an additional quarter of a year of mental growth.

What a difference in teaching ability of this amount is worth in dollars and cents, it is impossible to say. Such a difference may be more important at certain age levels than at others; or in some subject fields than in others. What does seem likely is that if a difference of this magnitude can be found between two teachers in a city school system, which system selects its teachers with considerable care, differences so substantial as to be worth much more from both an educational and financial point of view can certainly be anticipated under the less favorable conditions prevailing in many localities.

Such value as this paper may possess lies not so much in the direction of pointing out specific readjustments of policy in the particular city studied, as in demonstrating the potential utility of this method of teacher ranking on a larger scale. Specifically, there would appear to be considerable promise in the use of this technique in those content fields, such as science and mathematics, which yield themselves readily to objective measurement. It is not claimed that this method can or ought to displace completely the methods of teacher-rating now in use. But it does suggest a beginning in that much neglected area of teacher training—objective measurement of teacher ability in terms of a meaningful unit.

PRACTICAL APPLICATION OF MECHANISTIC AND ORGANISMIC PSYCHOLOGIES TO CURRICULUM MAKING*

Building with Mental Ability and Feeding Its Growth

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The interpretation for practical use of educational theory is a difficult and often a thankless task. The one who endeavors to interpret runs a double risk. There is always the chance, on the one hand, that he will be disowned by the theorist, and, on the other that he will be maligned by the practitioner for whom new points of view may mean major and often times painful readjustment of practice.

The difficulty of interpretation in education is evidenced by the fact that rarely are educational programs found in which the implications of particular points of view are consistently applied. This condition exists in the first place because transition from a program actually in operation to another type of program which may be implied by the adoption of a new theory is retarded by the force of social inertia which makes impossible a sudden, complete revision of practice. Consequently, a certain amount of inconsistency is characteristic of any developing program. In the second place, understanding of the implications for practical situations of a particular theory must be discovered to some extent by first-hand experience. When such experience is inadequate, interpretations are especially subject to question and controversy.

Treatment of the practical application of the mechanistic and organismic theories of learning is especially limited by the fact that only preliminary, exploratory work has been done concerning the application of the organismic point of view to practical curriculum problems. There are no curriculum programs which illustrate application of the organismic point of view in a unified or comprehensive way. Furthermore, the mechanistic point of view has been applied in many curriculum programs in conjunction with an incompatible philosophy of education. This has resulted in major inconsistencies in many curriculum programs in which the mechanistic point of view presumably has been followed. Consequently, it is highly probable that those who hold these respective

*Paper presented at the annual meeting of the Society for Curriculum Study at Cleveland, February 24, 1934.

points of view may object to certain implications which I suggest for practical curriculum making of the two theories. In fact, upon examining preliminary efforts to apply the organismic approach to teaching methods, I find conclusions and illustrations which seem to me to be highly inadequate interpretations of the theory. Others, no doubt, will have the same experience with my efforts.

I approach this task of interpretation as a worker in practical curriculum programs. I am interested, as I believe most curriculum workers are, in the major implications of these two theories for curriculum procedures. The minute distinctions and points of disagreement I am happy to leave to the theorists. Consequently, I shall endeavor to suggest how, in the broad, these theories may effect practical, operating programs of curriculum making.

Just what practices and procedures are sanctioned by these two points of view depends upon the persons who are interpreting the theories. New developments in some schools of psychology that are classed as mechanistic suggest that after all the differences may not be so great as we frequently are led to believe. On the other hand, there are those who see the two points of view as irreconcilable extremes. Wheeler for example, states:

"This new conception of nature demands a new conception of education and an altogether different type of teacher training. It demands a widely different type of curriculum than we now have, all along the educative scale . . . It repudiates, unqualifiedly a mechanistic conception of nature, of evolution, growth and learning."[1]

Within the limits of this paper we will have opportunity to examine briefly only a few points at which procedures in curriculum making might be materially modified by application of these points of view.

Determination of the aims of education is generally considered one of the major tasks of curriculum making. A variety of procedures has been employed to determine and organize aims for use. The fundamental concepts underlying the large majority of these procedures are mechanistic. Aims are determined deductively but are assumed to be achieved on an inductive basis. For example, general or ultimate aims are analyzed through a varying number of steps into specific or immediate aims. The specific aims are allocated to grade levels according to difficulty. The task of instruction is to achieve each specific aim, adding it to those achieved before, until finally at the close of the elementary school period

[1] *School and Society*, December 9, 1933, p. 757.

the aims of the elementary school have been achieved, at the close of the junior high school period the aims of the junior high school have been achieved, and at the completion of high school the general aims of education are at last realized in full.

This may sound like an overly simplified statement of the procedure but it is nevertheless essentially what is attempted in one form or another in many curriculum programs. It is true that the procedure is carried through with varying degrees of thoroughness, as is evidenced by statements of aims in courses of study, but there appears to be a common tendency to state general aims and to deduce from them more specific ones for grade levels. An illustration from a course of study in which the analytical procedure for determining aims was followed with great care and thoroughness will show the point to which the procedure may reach.

One of the aims for reading as stated in this course of study is "to fix and to expand desirable reading habits". On the first grade level under the development of right habits of eye movement are specific objectives such as:

1. To acquire the ability to read the entire line before returning to the beginning of the next line.
2. To acquire the ability to read in large word groups.
3. To develop the ability to progress regularly.

On the second grade level some specific objectives are:

1. To develop the ability to recognize increasingly longer units within a single eye pause.
2. To learn to decrease regressive eye-movements.
3. To develop further the ability to read with shorter periods of fixation.
4. To learn to acquire accurate return sweeps from the end of one line to the beginning of the next.

In the third grade objectives such as the following are found:

1. To increase the ability to recognize a short group of words at a single "eye-pause."
2. To develop the ability to recognize the sentence as the unit of thought in oral reading.

In courses of study in which the procedure has been employed we find very general use of expressions such as, "To further develop" and "To continue to develop." Some of the statements are quite ingenious

in getting around difficulties of analysis. For example, here are specific aims stated for fifth grade language in another course of study:

1. A little firmer holding for accuracy of form, not, however, at the expense of fluency and originality.
2. Some increase in written work, but with the oral work still receiving the greater emphasis.
3. More definite attention to paragraph building.
4. Teaching of other correct-usage tables, with review drills on those already given in the fourth grade.
5. More exercises in enunciation and in punctuation practice.

This technique of analysis is applied with generalizations as well as with skills. On each level a particular concept is supposed to be developed to a certain stage until finally the total concept emerges.

The extent to which analysis of objectives is sometimes carried is suggested by the findings of the committee on social studies of the National Survey of Secondary Education. One course of study for seventh grade social studies lists 135 objectives. One course in another subject contains 85 objectives. One course for junior high school contains 47 pages (mimeographed) of objectives.

Such a conception of aims appears to be incompatible with the organismic point of view. According to this concept the inclusive pattern of conduct or ability as a whole must be functioning for the pupils on all grade levels. Out of the whole certain parts may tend to be individuated on certain grade levels, but the whole is always the base and foundation. Thus, it becomes impossible to assign to particular grades or parts of grades portions of general objectives to be achieved. To revert to our previous illustration, the ability to read, according to this point of view may not be broken up into eye span, return sweeps, and regressions to be treated separately. Rather, reading must be considered as an evolving whole at all times. Each part must function in some way with all other parts from the very beginning. The problem of teaching is to get a suitable rhythm of all the parts rather than performance of isolated parts. Consequently, according to the organismic point of view, it appears undesirable to break down general aims into specific or immediate aims and to endeavor to locate these parts on grade levels for sequential development. Rather, aims, stated in terms of general patterns of conduct or of abilities arranged in those relationships in which they function normally become the guide throughout the development of the child.

There would be one general list of aims for an educational program. Each step in the education of the child would be a process of reconstruction or refinement of the modes of behaving which were employed in the beginning in cruder form. Thus, aims from the organismic point of view cannot be broken down and conceived as goals to be reached progressively by the pupils, as has been done so generally in interpretation of the mechanistic point of view.

It is interesting to note that in some schools where detailed statements of aims have been used, changes have been made to the more general form of statement. "The Denver course of study, published in revised form in 1926, contains lists of classified objectives for each grade and long lists of standards of attainment for each course, while the latest tentative revision includes only brief unclassified lists of objectives for each grade and a series of 'general understandings' for each course. The Oakland course of study, published in 1923, provides lists of classified objectives for each semester, while the latest tentative revision includes only brief lists of unclassified objectives for each unit. In both cities, then, a simpler formulation of smaller lists of unclassified objectives seems to have displaced rather detailed classified lists found in earlier courses of study."[2] This suggests that, from practical experience some curriculum workers have found unprofitable the elaborate analysis implied by full application of the mechanistic concept to the determination of aims of education. In my judgment this is precisely what has happened. Observation of curriculum committees struggling to analyze aims and place them on grade levels so as to provide for sequential development leads to this conclusion. I suspect from examining courses of study that most committees have been unable to achieve the task satisfactorily and have included a statement of aims on grade levels largely because it is the customary thing to do in curriculum making.

This leads us to the second major point for consideration, which is the method of defining the scope of the curriculum. This is a problem which has received very inadequate consideration in curriculum making. The most general assumption has been that analysis of the aims of education as just described, and placement of specific aims on the respective grade levels is a satisfactory way to define the scope of the

[2] *Instruction in the Social Studies*, Bulletin No. 17, 1932, Monograph No. 21, National Survey of Secondary Education, U. S. Office of Education, p. 9.

curriculum. If analysis of aims into specific parts violates fundamental principles of learning, other methods must be employed to define the scope of the curriculum. Exploratory work in the development of such methods has been done in some curriculum programs. However, it is not our purpose here to discuss these other procedures, suffice it to say that a complete re-thinking of the problem of defining the scope of the curriculum appears to be required by the organismic point of view.

A third point at which the implications of the two psychologies appear to suggest different procedures is in connection with the organization of instruction. The difference comes in the focal point of organization. Instruction organized on mechanistic principles tends to have its focus outside the learner. The controlling idea appears to be that the pupil is aroused to activity of the desired type by external factors. As Bode suggests, the implication is that "The pupil is just so much raw material awaiting the manipulation of the teacher." The result is that the curriculum maker tends to concentrate on external forces which he believes he can bring to bear on the child in such a way as to secure the desired type of activity. The problem, in brief, is to provide stimuli which cause the learner to act in certain desired ways. It is the task of the teacher to provide situations involving such stimuli. This can be done most easily and effectively if the various responses that are desired are arranged in order of difficulty and organized by subject fields. It can be achieved most economically if the child is required to react to each stimulus a certain number of times at given time intervals. Consequently, the problem of organizing instruction is that of arranging for the application of stimuli at suitable times and in proper order. As a result we have arithmetic organized in a logical sequence which carries the pupil through a planned series of stimulus-response situations. A given response is required a given number of times at specified intervals. In geography we have levels of difficulty measured by the intricacy of concepts and the requirement of successful completion of one level before proceeding to another. In history and literature we have chronological development with emphasis on each item of information which is to be added to the preceding items, thus gradually building an understanding of history or literature. The unit of instructional organization becomes the immediate stimulus-response situation. One instructional unit is tied to the next because of its logical relationship. In brief, the ideal organization of instruction from the mechanistic point of view seems to be achieved when the teacher knows in advance precisely what activities the pupils are to engage in,

what stimuli will produce the desired activities, and the order in which it is desired that the activities be carried on. Thus, the teacher assigns, grades, groups, questions, rewards, punishes, and urges in order to get children to react with the desired activities at the proper time and in the desired sequence. If the particular activity to which attention is directed is engaged in, the teacher has successfully conducted her work.

Curriculum making from this point of view has the task of indicating for the teacher the particular responses that are desired, and the order and frequency of these responses. As the specific abilities to be developed are thus defined, experimental procedures may be employed to discover the most valuable materials for developing given abilities. Once discovered, these materials become relatively uniform in use until further experimental work has revealed possible improvements. In this way a definite base is provided for selecting and organizing instructional materials.

From the organismic point of view this concept of stimuli relatively external to the learner, applied on schedule by the teacher, is not acceptable. Rather, learner and environment are considered one. The learner in the situation becomes the focal point of consideration and his experience the means of education. Educational possibilities are present as felt wants or goals arise for the individual. Activities take on meaning as they are thrown into peculiar relationships as means to the desired goal. Thus, the intent, or goal, or purpose of the individual becomes a major point of reference for organizing instruction.

For curriculum making this means that instructional organization cannot be set up in rigid form in advance. The precise stimuli and responses cannot be anticipated in full for they are complex of relationships and seldom take the same form. Since this is the case, the teacher must have freedom to deal with these complex situations with all their peculiar elements as they arise. This suggests that the restrictions of prescribed pages in textbooks, sequential organization of subject matter, restrictions within narrow subject fields, and strict time allotments must be lessened, and that instruction cannot be organized in advance as it is to be given. Instead, the teacher must be furnished with raw materials of instruction. He must employ these materials in the relationships dictated by the intent, or goals, or purposes of the children he is teaching. He must, in brief, look to the learner, in the particular situation in which he finds himself for the focal point of organizing instruction.

Another phase of curriculum making upon which the organismic point of view appears to have distinct bearing is in connection with courses especially designed to relate or integrate facts and skills mastered in other courses. I refer, for example, to such phases of instructional programs as the auditorium work in platoon schools. Case states of the function of auditorium work that "it is here that the pupils learn to interpret the classroom activities in terms of life and social situations, . . . "[3] The concept evidently is that activities are first carried on in the classrooms in such a way that they are unrelated to life and social situations, and later are brought together or integrated. This appears to be an effort to build a whole by combining a variety of more or less discrete parts. By assuming that learning is carried on effectively by securing some information in one place and some in another, all of which is to be brought together finally in organized form by the auditorium teacher, the basic concept of the organismic point of view appears to be violated. Similarly, the organismic point of view leads us to question the organization of special courses for character education, for health education, and for the purpose of summarizing, rounding out, or terminating work of specialized nature.

As my last point, I wish to emphasize what appears to me to be a misinterpretation of the organismic point of view. It has been suggested by some sources that the principles of the organismic point of view will be observed if instruction is organized around larger topics than has been customary. One interpretation, for example, which assumes this to be the case follows:

When the teacher of American history takes up the study of the Revolutionary War in the fifth grade, she does well to present the story of the war in general outline first and then to develop the various phases of the general subject in detail. The pupil who is properly oriented as to the general field will get the detail more effectively, more fully, and more correctly, because the whole determines the properties of the parts. (Law of Determined Action). A clear definite general picture of the whole matter as a starting point for the work on a larger unit of subject matter serves as a convenient filing case with compartments properly labeled to store away a wealth of interesting detail in an orderly way, keeping its organization intact and avoiding all confusion. When a child is properly assisted in organizing subject matter in the light of the whole he will not only learn the facts with least effort, but he will

[3] Case, Roscoe David. *The Platoon School in America*, Stanford University Press, 1931.

be able to relate fact and generalize, because facts are learned in their right relationships in the first place.[4]

As I interpret the organismic point of view, this illustration may or may not be an instructional unit that observes organismic principles. Whether it does or does not depends on the *complete* situation and the situation is not complete without the learner. The intent or goal of the learner and his past experience cannot be left out of consideration as a major determinant of the characteristics of the whole. The stimulus-pattern is only partially in view when the learner is not in full view. The foregoing interpretation leaves out these important considerations and thus omits the *locus* of the stimulus-pattern.

This is a very important point if it is sound interpretation. It warns against artificial reshuffling of subject matter externally to the learner. It warns against the effort to organize instruction in detail in advance.

In conclusion, it is my judgment that our greatest danger as practical curriculum workers is in superficial interpretation of concepts of learning. We have been too much concerned with techniques and procedures and too little concerned with fundamental principles. Frequently, I believe, we employ particular techniques and seek their justification in theory after the act rather than before. We may well afford, in the face of conflicts in theories of learning to give greater attention to the theories to which we subscribe and to the development of procedures which make these theories really operative. Curriculum making has too generally worked from the answer backwards through the procedure. The result is that we have a number of curriculum procedures but relatively little fundamental curriculum reorganization. Thorough study of theory first and the development of procedures second should help correct this situation.

[4]Norem, G. M., and Wiedenaenders, M. F., *Studies in the Psychology of Learning*, Educational Psychology Series No. 1, VIII, University of Iowa Studies, p. 44.

AN APPROACH TO THE MEASUREMENT OF BIOLOGICAL ATTITUDES AND APPRECIATIONS*

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ALTHOUGH frequent reference is made in most elementary school nature study courses to objectives involving the development of attitudes and appreciations, not a great deal is known about the effectiveness of such instructional effort. This is due partly to the difficulty in directing the acquisition of subtle elements going to make up attitudes and appreciations, and partly to the absence of adequate measuring devices for evaluating the outcomes. It is the purpose of this study to suggest experimental means of analyzing the efficacy of present teaching methods in this respect, and to indicate research problems which may arise from such an analysis.

In attempting the measurement of any of the constituents of attitudes and appreciations, it must be recognized from the outset that it is possible only to discover manifestations of selected elements in a given situation under a known stimulus; that individual responses to details of a situation may vary from time to time depending on physiological conditions, and extended and immediate pre-conditioning by a host of environmental factors. Re-tests on identical questions involving the expression of attitudes have demonstrated that such attitudes may be altered definitely by stimuli of varying nature within even a few seconds. It will, therefore be judicious to formulate a testing program with due cognizance of the limitation of such testing materials, and with provisions to guard against the misinterpretation of results.

A standard dictionary defines attitude as "State of mind, behavior, or conduct regarding some matter, as indicating opinion or purpose." The same authority gives as a meaning of appreciation, the quality of esteem or distinct perception. Accepting such definitions, it seems that the measurement of attitudes and appreciations is concerned with determining the state of mind with which an individual may distinctly perceive or esteem an idea or group of ideas. It is the task of recording human beliefs at a given time with respect to a specific question or problem.

*As related chiefly to elements in the plant and animal kingdoms.

Activity in the field of such measurement was evidenced as early as 1898 with Sumner's report on the investigation of beliefs. This was followed by the work of Young and Thurstone employing the order-of-preference technique. Some work has been done by means of analyzing questionnaire responses, such as that of Cavan, Baumgerten, and Pointer. The controlled interview method has been used with success where the subject could be given an individual examination. Measures which purport to reveal attitudes without the subject's awareness of the revelation have been devised by Watson and Shuttleworth. Word association tests, reactions to superstitions, and paired contrasting statements have likewise been utilized. The most common type of test, however, is the arrangement of statements to which the subject may react positively or negatively with provisions for partial responses between the two extremes. Examples of these techniques will be found in Harper's *Social Attitudes Test*, Bogardus' *Social Distance Scale*, Harper's *Test on International Attitudes*, the *University of Chicago* (Thurstone) *Attitude Scales*, *Hill's Test of Civic Attitudes*, Watson's *Test of Public Opinon*, and others.

To the writer's knowledge, no adequate test has yet been devised with particular reference to biological attitudes and appreciations. It is proposed, then, to adapt techniques which have been utilized in studying other types of attitudes, to the problem under consideration. It is recognized that certain vocabulary difficulties will be present, especially in the lower grades, but it is believed that these may be overcome by a proper analysis of the study materials in those grades. The following testing suggestions relate to elements both in the plant and animal kingdom such as is found in a nature study course for the upper intermediate grades.

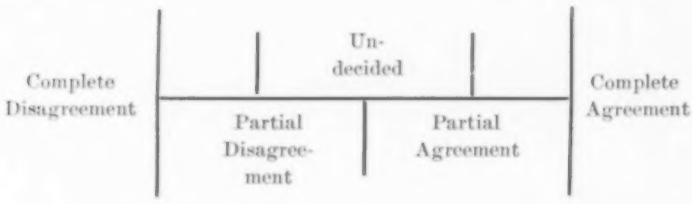
1. Recording partial, complete or undecided reactions to statements of fact, theory or description of a situation.

   Test Example:

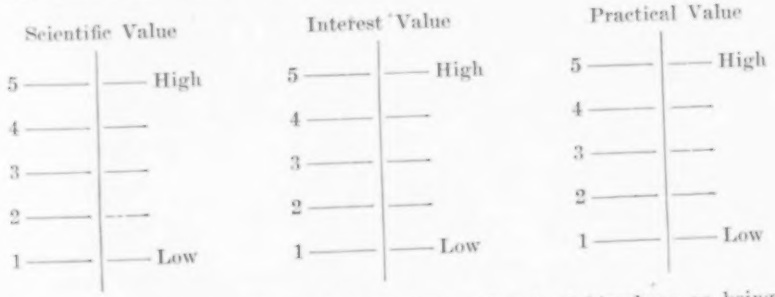
   Pitcher plants should be exterminated because they destroy many insects of value to man. (Check one)

   (a) Complete disagreement ( ); (b) Partial disagreement ( ); (c) Undecided ( ); (d) Partial agreement ( ); (e) Complete agreement ( ).

Scale Example:



2. Recording emotional expressions which may indicate the individual's feeling toward a situation.
   Test Example: (Check one)
   The thought of a water beetle seizing and devouring a harmless tadpole leaves me feeling:
   (a) Sorrowful ( ); (b) Indignant ( ); (c) Unaffected ( ); (d) Thrilled ( ); (e) Joyful ( ).
   Scale Example: Same plan as in Example No. 1.
3. Recording the individual's attitude toward changing a situation to his satisfaction, if he were in undisputed authority to make the change.
   Test Example: (Check one)
   If I were in a position to, I would:
   (a) Destroy all plants even resembling fungi growths ( );
   (b) Eradicate all fungi plants from the earth ( );
   (c) Exterminate only poisonous species of fungi ( );
   (d) Cultivate fungi plants in my garden ( );
   (e) Invent severe penalties for the destruction of any species of fungi ( ).
4. Recording the aesthetic expression which may indicate the individual's feeling toward a situation.
   Test Example: (Check one)
   The sight of growing mushrooms is to me:
   (a) Repulsive ( ); (b) Ugly ( ); (c) Unimpressive ( ); (d) Pretty ( ); (e) Beautiful ( ).
5. Recording pupil opinions regarding the relative worth of a given knowledge.
   Test Example: (Check each scale)
   The female cabbage butterfly lays her eggs in clusters near the ribs on the sheltered underside of a cabbage leaf.



6. Recording ideas of conditions in the plant and animal kingdoms as being analogus to a form of social justice.
   Test Example: (Check one)
   To me the act of a spider trapping in his web a harmless and unsuspecting insect is most like:
   (a) Kidnapping and harming an honest citizen ( );
   (b) Fouling a basketball opponent in a trick play ( );
   (c) Unavoidably jostling a person in a swinging door ( );

(d) Taking in and feeding a hungry dog ( );
(e) Providing a good home for an orphaned child ( ).

7. Recording expressions reflecting certain specified but broad interests or attitudes of mind.
Test Example: (Check one)
I am interested in growing plants from the viewpoint of:
(a) Botany ( ); (b) Painting ( ); (c) Music ( ); (d) Drawing ( );
(e) Chemistry ( ).

8. Recording expressions involving the olfactory appreciation of odors or scents.
Test Example: (Complete each statement)
The odor or smell which I recall as being most pleasantly identified with nature is..... The most unpleasant odor or smell is .....

9. Recording expressions which may throw light on sounds characteristic of elements in the world of nature.
Test Example: (Complete each statement)
To me the sound in the plant and animal kingdom which is the most pleasing to hear is..... The sound which is the most unpleasant is .....

10. Recording expressions of human character traits analogous to conditions found in the plant and animal kingdom.
Test Example: (Check one)
To me the term which best describes the dodder is:
(a) Treacherous ( ); (b) Mean ( ); (c) Harmless ( ); (d) Kind ( );
(e) Noble ( ).

11. Recording expressions possibly indicating kinesthetic or peripheral reactions to elements in the plant and animal kingdom.
Test Example: (Check one)
I would feel least affected by having to hold in my hands:
(a) A water snake ( ); (b) A spider ( ); (c) A worm ( ); (d) A plant root ( ); (e) A corn stalk ( ).

12. Recording choice of responses to contrasting statements relating to broad concepts and generalizations.
Test Example: (Check one)
To me the most alluring characteristic of flowers is:
(a) Its aesthetic appeal enhanced by its beauty and fragrance ( );
(b) Its production of seeds which in turn produce new plants ( ).

13. Recording responses to free word-association situations relating to plants and animals.
Test Example: (Complete statement)
The first word which occurs to me after reading the word BACTERIA is .....

14. Recording reactions to controlled word-associations possible in the realm of plant and animals.
Test Example: (Complete statement)
The word which first occurs to me as being (similar) (opposite) to the word ROSES is.....

The more critical reader may immediately challenge the validity of such tests. The answer is that all testing techniques are developed by experimentation. Furthermore, it can be argued that whatever is measured by such tests, shapes attitudes and appreciations through the integration and interpretation of environmental elements. The critic may then rightly question the practical value of the tests. By way of replying, it may be well to indicate proposals for their administration and use.

It is believed that such tests should be administered independently of any achievement tests which might be used in the study. Their content should not be "taught" or emphasized by the teacher in any manner if an attempt is made to measure the effectiveness of present teaching method. Examples of, or reference to, such tests should not be purposely included in the student's study materials. The tests should be administered immediately *before* and immediately *after* the subject which they concern has been studied. This will allow an examination of the changes which have occurred during the study period. Delayed responses may be obtained after an extended period of time has elapsed, to discover the permanency of the attitude or appreciation indicated by the former test responses.

To provide as much as possible for eliciting an honest response from the students, they should be given every assurance that their answers will in no way be used to their disadvantage. The writer believes that this can be accomplished by discussing with the group the issues involved before the tests are distributed. The students should not be required to write their names on the test blanks. The latter can be numbered and distributed in such a way as to reveal the identity of the student without his awareness.

With certain modifications, similar testing techniques could be applied to subjects other than biological, and it seems reasonable to expect a goodly share of valuable information to come from such a project. A few thousand responses from different school populations may point the way to more effective educational methods.

THE FEASIBILTY OF ABILITY GROUPING

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Ever since the introduction of a system of school grades there have been protests against the resulting lock-step. The more recent movement known as homogeneous or ability grouping, which is an effort to refine the grading system, has provoked its share of criticism. It is the purpose of this paper to discuss, not the general merits of such grouping or sectioning, but simply its feasibility, toward which some of this criticism has been directed.

Courtis[1] pointed out as early as in 1923 that "sectioning on the basis of intelligence scores is apparently proving to be a temporary expedient, a more refined method of grading, but not an ultimate solution." In 1925, Washburne[2] called attention to the overlapping of sections and to the wide range of ability remaining in any single section. Hollingshead[3], in 1928, as a result of his efforts to discover the best method of sectioning, concluded that none of the measures he used greatly reduced the heterogeneity of the total group. In 1930, McGaughy[4] advanced as the most important argument against homogeneous grouping, the fact that there is not and cannot be such a thing as a truly homogeneous group. In 1931 there appeared a study by Burr,[5] in which the facts as to the overlapping of sections were portrayed for six cities.

Now it is highly desirable that those interested in sectioning educational groups should have it made plain to them that no basis of sectioning will eliminate overlapping in respect to any measure other than that used in sectioning. It was, therefore, educationally valuable and in the interest of a more complete portrayal of all the facts, that Burr should have deseribed this overlapping. To use his own words, his study "was designed to synthesize considerations based on the differences in mean achievement of homogeneous groups with considerations arising from the

[1]Courtis, S. A. "Contribution of Measurement," *Bulletin of the Department of Elementary School Principals.* Second Yearbook, 1923, p. 161.

[2]Washburne, C. W. *Twenty-fourth Yearbook*, National Society for the Study of Education, Part II, p. 151.

[3]Hollingshead, A. D. *An Evaluation of the Use of Certain Educational and Mental Measurements for Purposes of Classification.* New York: Teachers College Bureau of Publications, 1928.

[4]McGaughy, J. R. "Homogeneous Grouping of Pupils," *Childhood Education*, VI, pp. 291-296.

[5]Burr, M. Y. *A Study of Homogeneous Grouping.* New York: Teachers College Bureau of Publications, 1931.

overlapping of achievements of groups in terms of variability." But, Burr's plea for a consideration of all the facts has had less influence than his portrayal of overlapping has had. There seems to have been a pendulum swing away from a limited consideration of central tendencies to a consideration of only overlapping and spread. Alice Keliher[6], in this phase of her critical study, gave no consideration to data which might show how different the so-called homogeneous groups are. She concluded that general levels of ability do not exist,[7] and took the position that grouping either has no general significance,[8] or is generally productive of homogeneity, only in the most limited degree.[9]

To be sure, "general level of ability" is a loose concept.[10] But it is useful in comparing the genius with the idiot. It still holds in comparing the gifted with the feeble-minded.[11] Is it likely that the concept has lost all its practical significance in the case of the bright and the dull? Are the so-called bright sections bright in no other respect than on the basis of which they were sectioned? In short, is ability sectioning fallacious and achieved in name only?

Obviously the question is not one of homogeneity vs. non-homogeneity, but of how much homogeneity. Or better still, it is a question of how much less heterogeneity there is in the ability sections than in classes in which no refinement of grading has been attempted. But with the question so phrased and with the facts regarding overlapping available, the interpretation of the data is by no means obvious. Assuming that it is desirable to have the bright, average, and dull in sections by themselves, what are the criteria in terms of which varying amounts of overlapping may be evaluated? What reduction from 100 percent overlapping between sections is negligible and not worth bothering with? What reduction is appreciable, and what of considerable significance in teaching? Burr[12] reported that the range of scores in a section may be anywhere from 33 to 100 percent of the range of the total grade. For his,

[6]Keliher, A. V. *A Critical Study of Homogeneous Grouping.* New York: Teachers College, Bureau of Publications, 1931.
[7]*Ibid.*, p. 163.
[8]*Ibid.*, p. 161.
[9]*Ibid.*, p. 90.
[10]Hull, C. L. *Aptitude Testing* (Yonkers, New York: World Book Co., 1928). Chapter II.
[11]Probably Miss Keliher would admit this, for in a footnote, p. 47, she states that her discussion does not pertain to the provision of special classes for feeble-minded children.
[12]*Op. cit.*

six cities, the average section range, varied from 68 to 85 percent of the total grade range.[13] Is the reduction to 85 percent an appreciable one, or must it go to 68 percent, or to 33 percent? These percentages are not sufficiently meaningful as bases for practical decisions. It is no wonder that for those who think ability grouping desirable the reduction in overlapping seems appreciable, and that for those who consider it undesirable the reducton seems so slight as to make ability grouping seem impracticable. There is need for additional information.

The measures of achievement generally reported are not altogether satisfactory for this purpose. They are not measures of progress during membership in a particular class, but are measures of progress from the beginning of learning. They are good measures of educational status but poor measures of ability to learn. Reviewing such data, Turney[14] concludes merely that the achievement of the ability sections differs.

Some pertinent facts, such as are needed, are available in the literature in the form of descriptions of work accomplished. Berry[15], for instance, reports that in the opinion of their teachers, 45.1 percent of the pupils in Z sections[16] and 91.5 percent of the X pupils completed a full semester's work. Taking the medians of Berry's data, the Z sections completed .9 of a semester and the X sections completed 1.3 semesters. The X sections by this computation did 44 percent more work.

Another example of description which gives more meaning to the relative ability of ability sections is supplied by Corning[17]. He reports that in the first grade, while the less able pupils read the basic chart and primer, the more able pupils read these and nine other books. This was an observation from four years of experimentation. It was followed by similar statements for other grades and subjects.

There is more meaning to the teacher in such statements than in percentages of overlapping. True, a description of ability sections is not

[13]For a discussion of the influence of errors in these computations, see Douglass, H. R. "Certain Aspects of the Problem of Where We Stand with Reference to the Practicability of Grouping," *Journal of Educational Research*, XXVI (January, 1933), pp. 344-53.

[14]Turney, A. H. "The Status of Ability Grouping," *Educational Administration and Supervision*, XVII (1931), pp. 21-42, 110-27.

[15]Berry, C. S. "The Classification by Tests of Intelligence of Ten Thousand First Grade Pupils," *Journal of Educational Research*, VI, pp. 185-203. See Table III, p. 192.

[16]The 20 percent making the highest intelligence test scores constituted the X group and the 20 percent who scored lowest, were called Z sections.

[17]Corning, H. M. *After Testing—What?* (Chicago: Scott, Foresman and Company, 1926), pp. 80-81.

complete without a measure of overlapping but surely the most direct way to determine to what extent the so-called ability sections really differ in ability is to compare them as to the amount learned in various subjects under comparable conditions.

Few if any studies have been undertaken in order to measure gains for this purpose, and few of such gains as have been reported for other purposes were made under the conditions which must exist if the gains are to be taken as indices of ability.

That certain conditions of teaching and of testing must exist will be evident from the facts reported by Carroll[18] in the field of spelling. He dictated to three "bright" sections and to three "dull" sections, 318 words from the work in spelling which was to be taught a year hence. He found that the bright could spell 81 percent of the "new" words and the dull 40 percent. The bright made 7,416 errors, the dull 24,882. In other words, from the teaching of spelling a year hence, the dull needed to learn three times as many words and needed to have three times as many errors corrected. Now, assuming that the bright are more able learners of spelling; that the teaching a year hence is largely limited to the work prescribed for the grade; and that the testing is likewise limited: what chance is there that the gains made by the bright pupils will be proportional to their ability to learn?

Perhaps spelling is an extreme case, but there is a strong likelihood that the same influences operate generally. According to Rankin[19], homogeneous grouping improves most the gains made by the dull, next, those made by the average, and least, those made by the bright. If this is the case, it is quite likely due to the continued limiting influence of grade standards upon the teaching of the brighter sections.

The history gains reported by Knowlton and Tilton[20] were made under conditions which satisfy the present needs fairly well. The same teacher taught both a bright and a dull section. Although, for experimental purposes, the teaching from section to section was as constant as the teachers could make it, the teaching involved an unusual degree of

[18]Carroll, H. A. *Generalization of Bright and Dull Children*. New York: Teachers College, Bureau of Publications, 1930.

[19]Rankin, P. T. "Pupil Classification and Grouping," Chapter III in "School Organization," *Review of Educational Research*, I, June, 1931.

[20]Knowlton, D. C., and Tilton, J. W. *Motion Pictures in History Teaching*. New Haven: Yale University Press, 1929.

enrichment, and the tests were designed to fit the teaching. These factors operated to make the measured gains a fair index of ability to learn. There were two factors which were undesirable for the present purpose. In the first place, the sectioning had not been done on the usual A, B, C, or X, Y, Z, basis. The 520 seventh grade pupils had been sectioned by taking the top 35 Otis Classification Test Scores, the next highest 35, and so on down the list. Thus the 15 sections were all different in "ability". The other factor which minimizes the value of the data for present purposes is the operation of an experimental factor in six of the fifteen sections. However both of these factors operated to minimize the difference between the gains made by bright and dull sections[21]. For all possible comparisons, the gain made by a brighter section was 125 percent of the gain made by a duller section taught by the same teacher. Many of the comparisons so arranged are between bright and average or between average and dull, rather than between bright and dull.

Making one comparison for each teacher, and that, the one most truly between bright and dull, the percentage is 143. The gain of the four brightest classes is 154 percent of the gain of the dullest four. In this case the teaching is constant in two cases and variable in two. Only two of these eight classes were experimental sections, and they were both dull sections. In spite of this fact, no section in the lowest quartile of "ability" equalled the lowest section in the highest quartile of "ability."

The gains reported by Knowlton and Tilton were made in history during five experimental units involving about ten weeks of instruction. Hollingshead[22] has reported gains made in reading and arithmetic under conditions which validate them also as indices of ability, and under conditions which add more meaning to the term "ability groups."

The gains in question were made as a result of a year's instruction in the sixth grade. They were measured on the Stanford Achievement Test. The 425 pupils were not actually sectioned. Hypothetical sections were made as follows: First, the records of all pupils outside a range of 18 months of Educational Age were discarded. Second, the remaining 274 were sectioned into three groups on the basis of National Intelligence Test Quotients. The highest 20 percent constituted the

[21]The experimental factor minimized the difference because in the comparisons made for this paper the experimental factor had raised the gain of more dull sections than of bright.

[22]*Op. cit.*

bright group and the lowest 20 percent the dull group. In reality, these groups were to a large extent taught by the same teachers. Since thirteen teachers were involved, the teaching was probably typical so far as being directed to bright and dull pupils is concerned. Since the 274 were very closely graded, the instruction was probably pertinent to the needs of all to an unusual degree. Under these circumstances, gains should reflect the "ability" of the sections. The reading gains of the bright group was 125 percent of that of the dull group. In arithmetic it was 146 percent. Hollingshead also graded hypothetically on the basis of Arithmetic Age, and again discarded the records of all not within an 18 months range. For the remaining 261, instruction in arithmetic was presumably even more pertinent to present educational status than before. In this case, the gain of the bright group was 188 percent of that made by the dull group.[23] Surely, when, because of ability differences, one section of an already closely graded group makes nearly twice as much progress as another, an organization of considerable educational significance has been effected. Although extensive overlapping and a need for adaptation to individual differences remain, the sections are in fact "ability groups", appreciably different in their capacity to do school work.

Many more of such comparisons are needed, for the data here presented constitute a very limited answer to the question to which this paper was addressed. Not only are the data not precise, but they are confined to the fields of history, reading, and arithmetic. So far as they go, they suggest that although much overlapping remains, a significant differentiation has been effected. In other words, such facts as are available indicate that ability grouping is feasible; whether it is desirable or not is quite another matter.

[23] Hollingshead does not report these percentages. In fact, he does not seem to have been interested in the gains which he reported, for no mention is made of them in his summaries or conclusions. As indicated early in the paper, his attention was centered upon the reduction of overlapping between groups.

SOCIAL ADJUSTMENT OF THE MENTALLY SUBNORMAL

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THERE can be no doubt that mental deficiency is one of the most serious social problems of our day. The stresses of economic conditions today confirm the well-known facts regarding both the menace and the burden of this class of citizens. Even under favorable environmental conditions, the social adjustment and economic success of the mentally subnormal are, at best, precarious. In times of social crises these marginal members of society are the first to succumb.

It is unnecessary to recite the many ways in which the mentally subnormal menace our social structure. Many scientific studies have amply justified the extensive experiences of all social welfare workers regarding the problems of dependency, delinquency, and illiteracy in this class of our fellows. It is no longer necessary to inform the public in these directions. What is more important is to promote practical programs for dealing with the situation in a constructive manner.

The feeble-minded are human beings. They are citizens. In France they are still termed "the children of the good God." They are our neighbors even though their immediate neighborhood may be a few blocks removed from our own. They do the humble work of society as servants in our homes, as operators in our factories, as laborers in construction, and as menials in many enterprises. Who shall say they are not worthy of their hire? Who shall deny them that small measure of protection without which their social liabilities exceed their social assets but which, when provided, holds them safe from the undertow of social degradation?

In dealing with the social menace and economic burden of the feeble-minded, it has been customary to emphasize the self-protective measures which will safeguard the normal members of the community. In the White House Conference of 1930, the subcommittee on the mentally handicapped shifted the emphasis from liabilities to assets and concentrated on the development of potential strength as well as safeguarding against overt weakness. There is an educational maxim of sound standing which says, "One way to offset a deficiency is to develop a compensating proficiency." Our program for the social control and occupational adjustment of the feeble-minded must supplement protective measures with more constructive devices. We must develop the limited abilities of the mentally subnormal to such a degree that their deficiencies will be supplanted by capabilities.

Our approach to the problems of mental deficiency today is limited to a body of knowledge gained from the social failures within this class. Nearly all of this information is limited to those feeble-minded who enter institutions, or who come before the courts, or who are the immediate objects of organized charitable relief. But these constitute only a small number of all the mentally deficient. Less than ten percent of all the feeble-minded, and probably not more than five percent, ever reach our public institutions. Since this minority is the group in which the social consequences of mental deficiency are most obvious and the hereditary nature of the condition most conspicuous, concentration on these facts provides but a limited view of the whole problem. We cannot much longer overlook the fact that the remaining 90 to 95 percent who do *not* reach institutions are not all social failures, even though their success may be only at a low cultural level.

Many feeble-minded children come from good families which are socially self-respecting and economically self-sustaining. These individuals seldom come to our attention except in the public schools, receiving as they do, good protection and safe care in a favorable environment. In the private institution for the feeble-minded we see this aspect of the problem in terms of the mental hygiene of the family rather than in the social menace of the individual, and one is amazed at the heroism of the parents in these families who do their utmost to meet this difficulty "on their own." In a complete view of the problem, we should not overlook the help and sympathy which should be extended to these families, since the burden is often too great for them to bear with justice to the parents or to the normal children in the family. On the other hand, the feeble-minded child of hereditary stock faces the double handicap of poor heredity aggravated by poor home environment. The feeble-minded parent can hardly be expected to provide those social advantages which might in some degree offset the limited mental endowment of such children. How to compensate for unfavorable home conditions in such cases is a problem which is not so easy to solve as may at first appear.

The total number of the feeble-minded is conservatively estimated at one percent of the adult population, or at two percent of the elementary school population. The higher percentage among juveniles is partly due to the greater ease of detecting mental deficiency in children and partly to the fact that the mentally subnormal as a class die at a much earlier age than do normal persons. (The available mortality statistics

place the average age of death of the institutionalized feeble-minded at about 25 years, while that of the normal population is about 50 years.

The feeble-minded as a class are not aggressively anti-social, nor are they aggressively promiscuous in their sex relations. On the contrary, the feeble-minded are passive and timid as a class. Their suggestibility, their ingenuousness and their lack of foresight make them easy victims of social circumstances. They do not seek unsocial lives. Rather, their lives are made unsocial because of their inability to cope with the difficulties of modern social life.

The feeble-minded of idiot degree, and also the majority of imbeciles, are a social burden rather than a social menace. The morons, who are much more numerous, constitute the principal problem. Even among them, the majority are fairly well adjusted socially, or at least can be made so if we will but provide for them some of the advantages that are provided for the mentally normal social classes.

The five principal agencies concerned with the consequences of mental deficiency are the home, the schools, the community, the courts and the public institutions. As noted above, 90 to 95 percent of the feeble-minded reside in their own homes. We have no exact knowledge at the present time regarding the nature of those homes which do not send patients to the institutions. Probably a very considerable number of these homes are sufficiently favorable so that we have no occasion to be interested in them from the point of view of community supervision. As already noted, these homes provide more or less adequate protection to the feeble-minded individual, and public measures are not usually necessary except from the point of view of mental hygiene.

The most conspicuous point of attack in the social adjustment of the feeble-minded is within the public schools. The feeble-minded child seldom constitutes a problem before the age of entering school. Even in his period of schooling he is a problem chiefly from the point of view of instruction and learning rather than from the point of view of behavior. If his period of schooling has been successful, he will seldom be a problem after leaving school, unless an unfortunate combination of social circumstances confronts him with difficulties which he cannot surmount. The behavior problems of the feeble-minded in school, and after leaving school, are usually the result of unfavorable environment or inadequate programs of school instruction. The well-behaved feeble-minded at school merely live along undisturbed and undisturbing in

the regular classes. They give concern to the conscientious teacher; they become the objects of ridicule or pity on the part of the normal pupils; they make but little progress educationally and socially because the school program is not adjusted to their limitations. The money spent upon their instruction in the regular grades is wasted because it accomplishes no good results. It were better to spend twice as much for half as long a period so that at least they could be taught something that they can learn and will make use of later.

Progressive schools have organized special classes for the mentally subnormal school child, and these classes have had a remarkable degree of success in spite of a rather general lack of enthusiasm for such classes on the part of school officials and boards of education. The per capita cost of instruction of children in these classes is usually twice as great as that for the normal child in the regular grades. But this cost is justified by the positive results obtained in contrast with the negative results from instruction in ordinary classes. Moreover, the education of the normal child is greatly improved when the subnormal child is provided for in a special class, so that the increased cost of special class instruction is more than justified by the increased benefits to both the subnormal and the normal child. Where these special classes have been provided with adequately prepared teachers and competent supervision, the results of instruction, and particularly the results in the direction of social adjustment have been little short of amazing. There is no point of attack in the whole program of protection of the feeble-minded so important as the public schools. One of the most serious indictments against the modern school official is his general lack of social consciousness in respect to this problem. Yet, some farsighted educators have made national reputations by the successful way in which they have provided special education for these exceptional children.

But even if the schools do provide special classes which are adequate in number and character, the benefits attained are but temporary if the mentally subnormal child leaves school at the close of the compulsory school period without a subsequent period of occupational adjustment. It is a serious criticism of most school systems that mentally subnormal children of compulsory school age are permitted to leave school or are even actually excluded from school during the period of compulsory school instruction. Democracy in education will not be achieved until these handicapped children receive their fair share of instruction in

terms of their capabilities for learning and adjustment. In view of their limitations they should be kept in school longer than the normal compulsory school period rather than for a shorter time. This is futile, however, unless the instruction in school is adapted to their needs. The most helpless victim of compulsory education today is the mentally subnormal child who must continue to attend school in the regular classes without being provided with a type of instruction suited to his capabilities. This has the vicious consequence of constantly confronting such children with their native limitations and creating in them a sense of helplessness and inadequacy which, all too often, results in social antagonism. We should respect rather than condemn those children who express their resentment in some form of social explosion. The docile subnormals live along harmlessly enough in the face of the inadequacy. Those who show their resentment in social misconduct are the more aggressive personalities and consequently the more promising cases.

One satisfactory method of continuing the schools' responsibility beyond the age limit for compulsory education is to provide a period of social supervision during the remainder of the child's legal minority. Theoretically, it would seem desirable that this continuation of education and adjustment should be provided under public school authorities, but the public schools, absorbed as they are in traditional instruction, have demonstrated a lamentable lack of social responsibility in providing continuation education. There has been little preparation of teachers and school administrators in this direction of educational sociology, and there is limited educational machinery and educational personnel for carrying out this responsibility.

This almost criminal negligence of ignoring the needs of the mentally subnormal child after he leaves the school should not be allowed to continue. This is the period of the greatest instability on the part of all boys and girls. At this age they have reached their physical maturity but have not yet developed more than a slight degree of social responsibility. They are at the most aggressive period in their lives, which is also their least responsible period. Small wonder, then that the boys become delinquent or criminal and the girls sexually promiscuous. We are most unjust in forcing this responsibility unaided, and we are hardly intelligent in meeting the situation by repressive measures. Far better to provide some system of tiding them over the period between irresponsible adolescence and responsible manhood and womanhood by constructive social supervision. This would capitalize the special class instruction

in the public schools through measures of social and occupational adjustment, and would stabilize their conduct during this unstable period as well as promote an occupational adjustment of some permanence.

It is during this period that the courts become chiefly concerned with the subnormal delinquent. It is a most interesting fact that the percentage of mental deficiency among offenders progressively declines as one goes up the age scale of delinquency and crime. Where statistical criminology is founded on adequate mental diagnosis, it appears that the percentage of mental deficiency is highest among juvenile delinquents and least among adult offenders, with reformatory populations in between. Feeble-minded offenders paroled from correctional institutions, broadly speaking, make about as successful adjustments as do mentally normal offenders; at least they are not recommitted more frequently. This may be taken as an evidence of the essential submissiveness of the feeble-minded and their responsiveness to programs of social rehabilitation.

Emphasis on the mental factor in crime and delinquency has obscured the much more important rôle of environment in the development of anti-social conduct. All criminologists recognize that the causes of crime are essentially social, and that the mental factor is only a predisposing rather than a precipitating influence. This is the most helpful aspect of modern criminology, since the environmental situation can be changed much more readily than can the mental endowment of the individual. The essential docility of the feeble-minded and their desire for social conformity become clear as soon as favorable environment is provided.

In this connection, I am reminded of a startling fact which was developed in connection with a crime survey of the City of Cleveland. The investigation of juvenile crime in that city twelve years ago revealed that the proportion of delinquency among the feeble-minded in the regular classes of the public schools was ten times as great as among those feeble-minded who were attending the special classes. This is a remarkable evidence of the importance of social supervision and adequate instruction in relation to juvenile delinquency. Similarly, a very careful study of 300 paroled inmates of a large eastern reformatory showed no relation between degree of mentality and success on parole, but a definite relation between success on parole and the immediate influence of the family. Other studies in New Jersey show the percentage of mental deficiency among reformatory cases to be only half of that found

among juvenile delinquents, and the percentage among adult offenders only half as great among reformatory boys.

While it may be theoretically true that a feeble-minded person is a potential delinquent in larger measure than is the case for the normal person, it appears to be a fact that this potentiality becomes progressively less as age increases. This seems to be an evidence of the fact that as age progresses the feeble-minded become progressively better adjusted. This is not because of systematic programs for the social adjustment of the older feeble-minded, but rather in spite of it, since few such programs have been seriously promulgated.

The greatest number of the feeble-minded are residents in the community. Many of them tend to live at low cultural levels and, therefore, tend to congregate in the less desirable sections of the community. We must not overlook the fact, however, that many of the feeble-minded are found in good homes, in good neighborhoods, and are reasonably well adjusted under the protection of their families. The helplessness of the feeble-minded in poor families exaggerates both the extent and the seriousness of their social dependency.

The community agency is, therefore, the ultimately responsible means for dealing with this problem except in the case of those who are committed to public institutions. Generally speaking, our public agencies are practically aware of the problems of mental deficiency and are dealing with these problems in a sympathetic and intelligent manner from the point of view of charitable relief. Very few communities, however, have provided systematic methods for dealing with the problem in terms of supervision and control rather than mere relief. What is needed in these families is more authority on the part of the social agency so that the supervision can be extended on a more constructive basis and so that these families can be provided with a larger measure of social protection. Where this has been done the results have been astonishingly successful.

This community aspect of mental deficiency raises a very interesting question of the possibility of providing in the community for those feeble-minded who do not require institutional care and custody. Institutional care is expensive, and this method of segregation is in many ways contrary to the happiness and usefulness of these people. The State Colony for the family care of the mentally affected at Gheel, Belgium, provides a striking example of the feasibility of caring for mental defectives in private families. In that city of 18,000 inhabitants, 3,000

patients, insane, epileptic, and feeble-minded, are cared for in private families under the supervision of a medically directed central institution. This plan is both more economical and more satisfactory to the patient and his family than is the plan of ordinary institutional segregation. The patient has the advantage of adequate medical care and social supervision, as well as the advantages of family life and personal freedom consistent with his abilities and limitations.

This plan is now being tried out in New York state and is proving successful on a limited scale. In view of the fact that the majority of the feeble-minded now live in their own families, there seems to be no good reason why they might not live at least as well or better as members of other families when that care is supplemented by medical and social supervision from a competent public body. Foster-family care of the feeble-minded offers the same advantages over institutional methods as has already been witnessed in the case of orphans, where placement is generally found superior to institutionalization.

The most important modern view of mental deficiency is the emphasis on the double handicap which confronts the mentally subnormal individual, namely, limited mental endowment and unfavorable social environment. The mentally normal person has a sufficiently hard time of life when he has to cope with environmental handicaps. These difficulties are obviously multiplied when the mental ability of the individual is less than normal. If the feeble-minded achieve only marginal success under favorable social conditions, it is not surprising that they fall below that standard when the environment is also against them.

The most hopeful aspect of the whole question is, therefore, to be found in adequate school instruction, systematic occupational adjustment and sympathetic social supervision. The institution plays a rôle of first importance in providing for those individuals who cannot be cared for under these three agencies, but the institution can never provide for more than a small minority of all the feeble-minded. We must, therefore, continue to look to the schools, the courts and social agencies for the development of constructive social measures, and we must continue to look to public spirited leadership to foster and promote more intelligent attitudes and more extensive facilities.

SUPERVISORY VISITS AND TEACHER RATING DEVICES

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To what extent do supervisory visits help classroom teachers to solve their problems? To what extent does the use of check lists and teacher rating devices represent good supervisory practice? Answers to the above questions were sought in a recent study of supervision and are reported herewith.

In order to make the relationship between supervisory visits and the solving of teachers' problems as definite as possible, the following five types of problems were considered; problems of classroom management, methods of teaching, diagnosis of pupils' difficulties, selection of subject matter, and the selection of materials of instruction.

It is frequently said that supervision is not popular with teachers, and that the supervisor is not a welcome visitor. Certainly the person most directly affected by supervisory visits and by the use of check lists and teacher rating devices is the classroom teacher.

Table I presents data of a limited investigation of teachers' reactions to supervision in terms of the teachers' opinion of the benefits derived from classroom visits by supervisors. This investigation was made in school systems in which the supervisory officers possessed good professional training, and includes the reports of 208 elementary, 101 junior, and 99 senior high-school teachers. The data were obtained by means of questionnaires, some of which were sent through the mail, and others were distributed by principals. In no case was it possible to identify any teacher with any particular set of questionnaire answers. These super-

TABLE I

PERCENT OF TEACHERS WHOM SUPERVISORY VISITS HELPED IN SOLVING DIFFICULT TYPES OF PROBLEMS

Code Number*	Elementary teachers		Junior H.-S. Teachers		High-School Teachers	
	YES	NO	YES	NO	YES	NO
1	72	28	85	15	88	12
2	68	32	74	26	61	39
3	81	19	98	2	31	69
4	90	10	94	6	25	75
5	86	14	96	4	8	92

*CODE
1. Do supervisory visits help you solve problems of classroom management?
2. Do supervisory visits help you solve problems of methods of teaching?
3. Do supervisory visits help you solve problems of diagnosis of pupils' difficulties?
4. Do supervisory visits help you solve problems of the selection of subject matter?
5. Do supervisory visits help you solve problems of the selection of materials of instruction?

visory visits include those of principals, general supervisors, special subject supervisors, and in junior high school and high schools the visits of the heads of departments.

These data indicate that supervision that is well planned is popular with teachers. Supervision that helps to solve teachers' problems is popular. For the group represented it is evident that:

1. Supervisory visits are effective to a high degree in helping the teachers to solve problems of classroom management in the elementary, junior high, and high school.
2. Supervisory visits are considerably less effective in the matter of problems of methods of teaching than in problems of management.
3. In helping teachers to solve problems of diagnosis, selection of subject matter, and selection of materials supervisory visits are effective to a high degree in the elementary and junior high school and to a low degree in the high school.

THE USE OF CHECK LISTS AND TEACHER RATING DEVICES

Supervisors have long felt the need of check lists and teacher rating devices as aids in recording observations of teaching. It has been said that check lists and rating cards help the supervisor to know what to look for in classroom visits. The supervisor, in order to do effective supervision, must know what to look for in the classroom. It has become a principle of supervision. Because of the stress laid upon this idea, it has been comparatively easy to establish the check list and teacher rating device as convenient or necessary working tools of the profession of supervision. Here is something ready to hand which tells the supervisor not only what to look for but also how to record what is discovered in the looking.

The fact that check lists and rating lists do tell the supervisor what to look for has resulted in the assumption of an intrinsic value in those devices which does not necessarily exist. The chief objection to the use of such devices is that in practice it tends to make supervisory observations stereotyped. To know what to look for is important, but to recognize what is seen and heard through supervisory observation is more important. To depend upon check lists and rating device data, in order to determine the quality of the classroom procedure under observation, is a confession of weakness in supervision.

Teachers object to having their classroom procedure subjected to measurement by check lists and rating devices. Whether such objection

is well founded is a debatable question, but since teachers do find the check-list, rating-device procedure objectionable the burden of proof regarding the good effect of such procedure upon teacher improvement certainly rests with those who advocate the use of those devices.

The writer completed a limited investigation in 1932 to find out the opinion of teachers as to whether the use of check lists and teacher rating devices represents good supervisory practice. The question asked was: "In your opinion as a teacher, to what degree does the use of check lists and teacher rating devices for recording supervisory observations represent good supervisory practice?" Table II gives a summary of the answers received from 2,848 teachers of kindergarten, elementary, junior high, and high school classes.

TABLE II

OPINIONS OF TEACHERS ON DEGREE TO WHICH THE USE OF CHECK LISTS AND TEACHER RATING DEVICES REPRESENTS GOOD SUPERVISORY PRACTICE

	To a very high degree	To a high degree	To a fairly high degree	To a low degree	To a very low degree	Total answers
No. of answers	117	115	151	1008	1457	2848
Percent of answers	4.2	4.1	5.4	35.1	51.2	100

A less extensive investigation of the opinion of supervisory officers concerning the effectiveness of the use of check lists and teacher rating devices was also made. The question was the same as in the case of the teachers. Table III gives a summary of the replies.

TABLE III

OPINIONS OF SUPERVISORS ON THE DEGREE TO WHICH THE USE OF CHECK LISTS AND TEACHER RATING DEVICES REPRESENTS GOOD SUPERVISORY PRACTICE

	To a very high degree	To a high degree	To a fairly high degree	To a low degree	To a very low degree	Total answers
No. of answers	18	27	60	66	41	212
Percent of answers	8.5	12.4	29.0	31.0	19.1	100

The number of cases in Tables II and III is small in comparison with the total number of teachers and supervisors in American schools. The data were obtained from only three states in the North East section of the United States. For this reason no claim is made that these data are

reliable for the country as a whole. But they are reliable as representing the opinion of nearly 3,000 teachers of an unselected group in three states. The fact that 86.2 percent of these teachers think the use of check lists and rating devices represents good supervisory practice to only a low degree or very low degree is strong evidence that there is something decidedly wrong with such devices as now used.

Table III shows that only approximately half of 212 supervisory officers think that the use of the devices represents good supervisory practice to more than a "low degree."

The favorable opinions recorded in Tables II and III are not uniform for teachers and supervisory officers. General supervisors give the highest percent of favorable opinion and teachers give the lowest. The order of favorable opinion by groups is as follows: (1) general supervisors; (2) principals; (3) special subject supervisors; (4) heads of departments; (5) classroom teachers.

A consideration of the foregoing raises some interesting questions:

1. Is the order of rank of favorable opinion regarding the use of check lists and rating devices due to the superior professional training of general supervisors and principals?
2. Is it due to the fact that groups 4 and 5 are individually more affected by the use of such devices? Be it remembered in this connection that the majority of heads of departments are part-time teachers.
3. Is it due to the fact that the consensus of opinion of so called educational authority as found in the literature of supervision, especially books on supervision, favors the use of devices, and that general supervisors and principals tend more to read and accept the opinion of authority than the other groups do?
4. Is it because the supervisors find the use of devices is the easier way?
5. Is it because obtaining objective data on supervising observations is (or to the supervisor seems to be) a desirable part of the scientific movement in education?

EDITORIALS

RESEARCH IN SCHOOL ADMINISTRATION

The first city superintendent of schools was appointed in Buffalo, New York, nearly one hundred years ago. During this century we have developed a philosophy, perhaps philosophies, of school administration. We have also developed an empirical practice. We have seen the duties and responsibilities of the position expand from a primarily supervisory and disciplinary nature to the place where the modern school superintendent is expected to be an expert in school finance, in buildings, in personnel management, in curriculum, in guidance, etc., etc. As the public demand has broadened for increased services, legal obligations and restrictions have been imposed and the work of the school administrator has developed. The growth has been in response to demands of the public and to the vision of the leaders in the field. The public has wanted larger services for their children and progressive school administrators have not only supplied what was demanded but with their keen insight into child needs have attempted to make provisions for wholesome child development which involved changes which in many cases the public has but vaguely understood. The present economic conditions with the blind battling against taxes and governmental expenditures have brought to the focus of attention school activities to which previously the public has given little attention. All these things call for scientific evaluation.

Studies have been made of what school administrators do, studies of needs in limited areas and studies of methods of doing specific activities. A number of books have appeared in recent years in the general field of school administration. These books, however, have very largely set forth the authors' personal opinions with occasional bits of data in restricted fields. There seems, however, to be little or no comprehensive research seeking fundamental relations between what superintendents do and what they are expected to do by their communities. We know little of the characteristics which make for success in school administration and we judge the results of the school administrator's activities by varying standards. Perhaps the field is entirely too extensive for any single piece of research but there is certainly a need for a thoroughly coördinated

series of studies all of which attempt to relate the present situation and the future development to a fundamental philosophy which will make for consistency both in the training of school administrators and in the performance of their duties. Until such comprehensive research has been developed we shall probably continue responding to economic and political pressure, to individual opinion and personal bias, training in piecemeal and evaluating inadequately.

Miami University E. J. Ashbaugh

ON THE TIMELINESS OF RESEARCH

A problem of considerable practical importance, probably not as generally recognized among research workers as it should be, has arisen in the minds of many field workers about the timeliness of research. Caught as most school people are by the urgent problems of the immediate present, most of the research appears to them very remote, academic, and inconsequential. Naturally, under such conditions questions arise, even among the most devout, as to the ability of science, notwithstanding its theoretical potentialities, to solve practical school problems. This is not a new problem, but, as a matter-of-fact, a very old problem made particularly acute by the present crisis in education.

There are, of course, persons who contend that research workers should not concern themselves with such matters. Aside from this issue which will not be discussed at this time, the writer wishes to offer certain comments upon the situation with the hope that in some manner the efforts of university workers can be brought to bear more directly upon the problems of field workers. At heart, the difficulty arises out of a sharp difference of opinion among university workers and field workers as to the problems worth studying. The watchword of university workers is fundamental research and that of field workers practical research. That these differences should arise is clear enough when one recalls the conditions under which each works. The things that impress the field worker most are the very immediate, urgent, and frequently reoccurring everyday problems of teaching, supervising and administration. The university worker, not so pressed by the demands of the immediate, is more likely to concern himself with the elements common to a number of such situations. It is perfectly clear that both have in mind the same objective. What the situation demands is some method of making this union between these two groups of workers more effective. That this bond of understand-

ing between field workers and university workers, which is, after all, the issue in the timeliness of research, may be strengthened, the writer would like to offer the following suggestions:

1. That university workers make from time to time careful surveys of the felt needs of field workers. Most university workers, even though they may have had at one time or another close contact with the problems of field workers, know very little in an accurate way about the problems of the field. This is in itself a matter amenable to investigation. To this suggestion, university workers will doubtless raise two objections: (1) field workers are frequently mistaken about their difficulties (the difficulties sensed by field workers are frequently not their real difficulties); and (2) the problems of field workers are temporary, fleeting, and inconsequential. The first objection, it would seem, could be answered by saying that it is true that field workers are sometimes mistaken as to the why or how of their felt needs, but nevertheless it would seem that these needs might very well serve as points of departure for systematic studies of a fundamental character. The answer to the second objection involves, in the first place, a question of fact: Are the difficulties felt by field workers everchanging, fleeting, and temporary? At least some of their difficulties must have been felt by many others for some time. In the second place, the answer to this objection involves a very difficult question of definition: What is fundamental research? If those problems felt by many persons over wide areas for a long time are fundamental, then certainly some of the problems of field workers are fundamental. There are, of course, other approaches to a definition of fundamental research.

2. That university workers take greater care in their reports of research to indicate the relatedness of their research to definite field problems. It would seem in a journal like the *Journal of Educational Research*, for example, devoted as it is to the problems of field workers, that special care should be taken to discuss the relatedness, importance, and implications of each piece of research to the problems of field workers.

3. That a definite and final ban be placed upon *piecemeal* research. Of course, this cannot be done because all research is piecemeal. What really is meant is that the university researcher should choose a field of research and stick to it. There are very few problems of any consequence that can be solved by a single isolated investigation or even by a few investigations no matter how brilliant the investigator. If research is not to appear trivial, piecemeal, and inconsequential, its relatedness to more

fundamental matters must be kept constantly before the reader even at the risk of some repetition. The difficulty is not with the "*piecemealness*" of research but with the "piecemealness" of researchers and their reports of research.

4. That a definite and final ban be placed upon the pointless repetition of research. In making this statement the writer is perfectly clear that many important conclusions need to be further verified. The difficulty seems to arise, however, not out of this situation but from researchers who do not appear to be clear about this necessity and who report research without due reference to previous research and who otherwise fail to make their intentions clear to the reader. Aside from the above considerations it would seem that publishable investigations of previously studied problems should offer: (1) either a report of a more comprehensive, extensive, long time investigation; or (2) a new and more effective technique of study; or (3) new conclusions of importance. For one reason or another much educational research does not conform to these standards.

5. That research workers keep themselves more alert to the newer aspects of old problems. If one is really engaged in fundamental research, he is engaged in the study of problems that have been and are likely to continue to be with the profession for some time. A little more alertness on the part of university workers at this point would make research appear much more timely. A good illustration of this point can be drawn from the researchers in the field of visual education. Now, as a matter-of-fact, visual education is really a very old problem. It belongs to the field of *observational* learning. This recalls to mind the fact that there are three fundamental ways to learn: (1) by observation; (2) by direct participation; and (3) by verbal communication. Laboratory and demonstration methods in science are also aspects of this same problem. Those engaged in fundamental research are sometimes afraid of being called opportunists. But the reason that opportunists are opportunists is not that they recognize the present day implications of their researches but because they fail to achieve any fundamental continuity in their efforts. While there are doubtless many new problems that have arisen out of the present crisis in education there are, of course, many very old problems which only appear new because of their present manifestations. These need immediate attention. The efforts of research workers can be made

to appear more timely if there were more alertness to the newer manifestations of fundamental issues.

6. That more attention be given to *integrative* research as opposed to *analytical* research. In analytical research wholes are picked to pieces and one part studied at a time. Now this sort of research is exceedingly important and offers an effective means of understanding complex phenomena not otherwise readily understandable. In integrative research the attention shifts from parts to wholes. It is usually preceded by analytical research and has for its purpose a study of the behavior of wholes as wholes. One may for example, interest himself in various systems of supervised study in which two or more sequences are compared, not from an elementalistic point of view but from the point of view of total effects. It is true that such problems offer real difficulties in the matter of controls, measurement, etc., but when carefully performed frequently approach much closer the felt difficulties of field workers than does analytical research.

The comments offered here have arisen out of a frequently observed criticism of research in the present crisis in education. Many persons feel that research workers are on the whole concerned with pretty trivial matters compared with the urgent problems of the present. I suspect that research workers are very much concerned about these urgent problems, but have somehow failed to make their interests apparent.

A. S. Barr

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

FORD, ADELBERT. *The Story of Scientific Psychology.* (New York: Sears Publishing Company, 1932), pp. xii + 307.

The author wrote this book "for the intelligent layman," undertaking to "present the subject matter of psychology, in its historical setting, with fidelity, and with all the . . . accuracy" that he was "capable of mustering, yet without sacrificing the dramatic quality of the story." Still, he feared that by his "humanness" he might "create distortion." (p. vii.) His fear is realized in many instances of distortion of fact and of fallacious reasoning, some of which deserve special mention here.

DISTORTIONS OF FACT

(1) "It was Hertz, *doddering old* German professor in a musty college laboratory, *playing with* a collection of static plates and induction coils, who found that he could *hurl force* across the room without wires." (p. v; italics mine.) Hertz was then 32 years old, and was 37 when he died. The important point is that the discovery was not a romantic accident of an aimless investigation. Several years before, Clerk Maxwell had assembled a group of propositions which were believed to be factually true, and had shown that they logically implied the assertion that these long-wave radiations exist, and have the properties which we now ascribe to them. Hertz deliberately *planned* a four-year experiment which (if it were properly executed) must either demonstrate the existence of those waves; or else disprove one or more of Maxwell's premises, and thus overthrow a very important body of doctrine in physics. Similarly, according to Gray,[1] Dirac *deduced* the existence and the properties of the 'positron' a year before Anderson demonstrated them; likewise Harkins and Rutherford independently deduced the existence and properties of the 'neutron' several years before Chadwick discovered them. Thus, the deductive method—which the author treats lightly—is a very powerful tool. *If a proposition is factually true, so are all its logical implications.* This axiom underlies the scholastic method, which is fundamentally sound. (The scholastics correctly assumed that from a limited body of factually true propositions, treated as axioms, one could *deduce* the results of every possible observation and experiment. The uncertainties inhere (1) in finding the right postulates; and (2) in avoidance of fallacies of reasoning—especially of *equivocation.* The program now appears to be most probably infeasible; but there is nothing in it that is conceptually unsound.) It also yields Dirac's rule: Don't 'investigate' at random! First, collect the assertions of empirical fact that you entertain. Rigorously determine their logical implications, and state the latter as hypotheses. These you may now

[1] Gray, G. W. "Discoveries within the Atom," *Harper's Magazine,* 168 (1934), pp. 340-352.

test by observation, and thus truly *experiment*.

(2) ". . . Galileo's postulations concerning a *round* earth, *justifying* the Ptolemaic assumptions of the Egyptians, profoundly shocked the religious susceptibilities of the fifteenth century . . ." (p. 21; italics mine.) Certain credible historians assert that Galileo taught mainly in the seventeenth century, not the fifteenth. His postulates contradicted those of Ptolemy instead of *justifying* them; they 'concerned,' not a 'round' earth, but a rotating and revolving earth. Following Magellan, ships had been sailing around the earth for 110 years before Galileo was brought to trial; the church could hardly doubt its roundness by that time; the second-century astronomy of Ptolemy, which the church affirmed, asserted that the earth is round. Incidentally, Galileo's *Dialog*[2] 'shocked' the faithful chiefly by presenting a burlesque of a certain "irrefutable argument" that had been dictated to Galileo some 16 years earlier by the cardinal who had since become Pope. "When the king sneezes, all take snuff," the Pope supersedes kings; and this Pope was enraged. Otherwise, the doctrines might then have been admitted to "consideration."

(3) "Descartes . . . utilized the arteries, whose functions were then unknown, as the supposed means of carrying 'animal spirits,' the thought units, from one part of the body to another. Unfortunately, his observations did not include nerve bundles!" (p. 8.) The first sixteen paragraphs of Descartes'[3] final statement of his doctrine of the production of bodily movement contradict every assertion in this passage, together with the implication that 'animal spirits' were units of thought, instead of being light, swiftly moving "material bodies" as we now conceive mètallic ions and electrons to be. As Huxley[4] remarked in 1870, so it holds in 1934, that the most modern concepts of nerve-physiology are mere restatements of Descartes, modified in mechanical details, and with new *terms* substituted for the old, but interrelated in the same way.

(4) Of the syllogism, "All men are mortal; Socrates is a man; Socrates is mortal," the author says that the first premise "is known as a 'universal' which Descartes held was presented to the mind . . . without the necessity of experience or experimentation;" while "to a modern scientist it is obvious that the truth of the conclusion stands or falls on the verification of the truth of the two premises . . ." (p. 8.) But obviously, the conclusion is *formally* true if it is implicated in the premises. It may be [*factually*] true even though one or both premises be factually false; to test its factual truth one has to observe whether or not Socrates *dies*. Says Descartes:[5] "The Dialecticians are unable to devise any syllogism which has a factually true conclusion unless . . . they have already ascertained the very truth which is deduced in that syllogism."

(5) Descartes "successfully avoided the fiery stake, the usual method of disposing of heretics." (p. 8.) Statistical evidence is meager; but according to

[2] Fahie, J. J. *Galileo, His Life and Work*, London: John Murray and Company, 1903.

[3] Descartes, R. "The Passions of the Soul," in *The Philosophical Works of Descartes*, by Haldane, E. S., and Ross, G. R. T. (London: Cambridge University Press, 1911), p. 336.

[4] Huxley, T. H. "On Descartes' Discourse on the Method of Rightly Conducting the Reason and Seeking the Truth in the Sciences," in *Method and Results* (New York: D. Appleton and Company, 1902), p. 184.

[5] Descartes, R. "Rules for the Direction of the Mind," in *The Philosophical Works of Descartes*, by Haldane, E. S., and Ross, G. R. T. (London: Cambridge University Press, 1911), p. 32.

Alphandéry[6] a very small *proportion* of those who were convicted by one zealous inquisitor were put to death. Descartes was never threatened.

(6) "Many were the tales *fabricated* by one Romanes, told as scientific fact." (p. 24; italics mine.)

(7) On pp. 98 f. a fanciful description of experimental stimulation of the brain asserts repeatedly that individual brain cells have been excited *singly*. This is not yet possible.

(8) "The simplest animals . . . live in a remarkably constant environment—constant in temperature, chemical surroundings, mechanical contacts, etc. They have need of only a few responses and these need have almost no variation." (p. 102.)

(9) "Some psychologists, such as John B. Watson and Knight Dunlap . . . assume that all human infants come into the world with the same or nearly the same mental capacity." (p. 112.)

(10) That Mendel's principles "apply to the transmission of mental capacities is now generally accepted." (p. 109.)

(11) On p. 83 is a description, inaccurate in essential details, of Wever and Bray's demonstration of the action of the auditory nerve.

(12) On pp. 72 ff. are given a "law" of color-mixture and a "law" of complementation without reference to the relative brightness of the component colors, which is a determining factor. The "law" that the hue which belongs to a given wave-length is independent of the "energy-value" of the latter is contradicted by facts of daily observation.

FALLACIES IN REASONING

(1) "I cannot find out what is in the mind of another person except by watching his vocal behavior." (p. 27.) The next two sentences assert that he cannot find out, even by such observation.

(2) "*It is possible for a psychologist to prove, experimentally, that a cold object is a warm object* . . . that black is white, that tall is short, that heavy is light, and so on." (p. 86.)

(3) Another contradiction: "There are a few people—*about one-quarter of the general population* as determined by the statistical experiments in *university classes*, who cannot see two fingers"—under conditions that favor double vision. (p. 200; italics mine.)

(4) The author says that Jastrow's experiments, which were made on only a few subjects, with a "really scientific ouija board," showed that "all people" move their hands when they think; and that other experiments show that "*we always speak when we think*, although the speech movements" require delicate instruments for their detection. (p. 96.)

(5) The experiments of Johann(es) Muller, and others which followed showed that each sense organ produces its own peculiar quality and never produces more than this one quality. The telephone theory requires that a given sensory fiber should produce several sense qualities." Thus he begs the question; no experimenter has yet demonstrated that a single fiber of the auditory nerve has been stimulated *singly*. The same criticism applies to the assertion that "a sensory nerve could not produce more than 60 pulsations a second" (in individual fibers).

(6) Of Jastrow's ouija-board experiment the author says: "*Every thought impressed upon that subject produced a corresponding movement.*" (p. 95.) This implies that the author had a means of telling *what thoughts* the subject had, which contradicts the hypothesis on his p. 27. Obviously, to determine whether

[6] Alphandéry, P. A., et al. "The Inquisition," *Encyclopedia Britannica*, XII (14th edition), pp. 377-383.

thought and movement *correspond*, or not, one must have access to both.

APPRAISAL

Not every part of this book is bad. Many sentences, and some paragraphs, are factually true and lucidly written. But some very good ingredients may go into a very bad cake. The author has not accomplished his laudable aim; but has presented a book in which some history of scientific importance is falsified; important facts misrepresented; all rules of reasoning violated; and in which, in many places, the trivial and commonplace are made glamorous in exclamatory and florid description. The 'intelligent layman' who reads it critically may well conclude: "If this be psychology, give me something else!" H. M. JOHNSON
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JERSILD, ARTHUR T., AND OTHERS. *Training and Growth in the Development of Children.* Child Development Monographs, No. 10 (New York: Bureau of Publications, Teachers College, Columbia University, 1932), pp. ix + 73.

Modern investigations in the growth and training of children are introducing important practical and theoretical considerations into the planning of school provisions for young children. Fixed standards for groups and goals of maximum achievement are gradually giving way to standards for individuals and goals of optimum achievement for age. The problem of maturation is being approached in a variety of organisms and at many age levels in the human.

Jersild and his associates have attempted to answer the following question: "Is it possible through special training in early years to raise a child's capacity beyond the level which would be achieved in the normal process of growth?" Experiments were set up in the field of mental, motor, and musical performance.

The functions studied included color naming, speed of free association, strength of grip, strength of back, vital capacity, tapping, vocal reproduction of pitch, and vocal reproduction of tonal intervals. Each investigation included an initial test and a final test given to two equivalent groups—experimental and control. In order to determine the persistence of training effects, retests were given after several months had elapsed. The subjects in the various experiments were from two to eleven years of age, although each study was limited to an age range of two or three years. A total of 121 experimental and 127 control subjects was employed. Since the numbers involved in any given experiment were small, findings should be taken as suggestive rather than final. Similarly, the results are conditioned by the length of the training period, which, in most cases was three days each week for a period of from three and a half to six months.

The general conclusions are of interest both to the technical student and to the practical worker with children. In all of the experiments the practice children showed some advantage over the control group at the end of the training period. The differences were not statistically significant in four out of the seven experiments. On the other hand, the retest after the cessation of training failed to show, with one exception, that the differences were maintained. The results suggest that native endowment, plus the factors of maturity and general experience, determines the relative status of the child.

The one outstanding exception where the practice group continued to have a superiority over the non-practice was in the case of singing. In this experiment

an effort was made to find the extent to which three-year-old children could be taught to sing tones and intervals not already included within their vocal range. The study does not answer of course, in any final sense, the question as to whether continued intensive training of this type might eventually raise the child's performance beyond anything that could be attained if training were postponed until later years. This presents a nice experimental and practical problem in the education of children.

We must not generalize too hastily on the implications of this series of experiments for other functions involving larger elements of adaptive behavior. The educator would like to see similar experiments on the early and delayed introduction of reading, of arithmetic, and of other materials where so often the ideals of precocious learning and of group standards have been held. We may be dealing with a fundamental generalization—that the achievement of children in most functions can be permanently kept only at a level determined by the individual state of maturation and that forcing methods are doomed to failure. It should not be ignored that throughout the experiments the individual differences among children at the beginning dominated quantitatively over the average effect produced by special training in the group. Further, the gains produced by practice were relative to the child's initial capacity. The evidence tends again to point to the dominating role played by individual differences of maturation in determining what may be expected of children at a given age.

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COLE, PERCIVAL R. (Editor.) *The Primary School Curriculum in Australia* (Melbourne: Melbourne University Press, 1932), pp. xiv + 310.

To the American student of comparative education this volume will be a valuable record of the present status of elementary education in a great dominion of the British empire. It is a carefully edited compilation of chapters written on Australian elementary education by a group of eminent educators from various universities, colleges, and departments of education in different parts of the commonwealth. Each of the co-authors has approached his subject in a constructive frame of mind and has exhibited not only familiarity with the problems of Australian education but also a broad knowledge of present developments in educational theory and practice in other parts of the world. It is of particular interest to the student of education in the United States to note the influence which educational leaders in this country have exerted upon Australian educational thought. Authors and publishers will be much gratified to know that the educators of that British commonwealth have received help from American books, monographs, and magazine articles.

On the whole the educators of Australin are confronted by the same problems as those which now confront the educational leaders of the United States. The challenge of a world-wide depression has caused them to revaluate their fundamental educational concepts. The volume takes a view-point about midway between the conversative views of the old education and a thoughtless endorsement of the new. The theory of the curriculum developed by Dr. Mackie, Professor H. Tasman Lowell, Dr. Cecil Andrews, and Mr. Peter Board in the first four chapters of the book is of particular interest to the student of present changes in edu-

cational theory and merits careful reading. The later chapters of the book are largely descriptive of organization, curriculum, methods, and measurement in Australian schools and furnish data for use by the student of comparative education.

In style and content the volume as a whole exhibits broad culture and scholarship among the gentlemen who contributed. The book is well organized and well written. From the standpoint of physical attractiveness, the volume exhibits somewhat less finish than books of a comparable character printed in the United States.

Your reviewer thoroughly enjoyed his contact with educational thought in Australia obtained through reading this volume. American educators and authors will extend cordial hands across the sea to the authors of *The Primary School Curriculum in Australia.*

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DUROST, WALTER NELSON. *Children's Collecting Activity Related to Social Factors.* Contributions to Education, No. 535 (New York: Bureau of Publications, Teachers College, Columbia University, 1932), pp. viii + 115.

This dissertation represents an elaborate analysis of the tendency of children to collect various objects.

The author first reviews *five* earlier studies in the field; all based on what Durost terms the extensive technic of the questionnaire. Durost also first resorts to an extensive check list. The result of this phase of his study caused the author to question the accuracy of that technique and to attempt further refinements in procedures. The questionnaire method of collecting data has been inadequate and misleading, "because children are not mature enough to distinguish clearly between owning or possessing and collecting. That phase of the study did show that collecting activity seemingly varies with mental ability and that there are few important sex differences.

Hence the contribution of this study is found in the main in data secured through intensive study of 100 cases on the interview technique where qualitative evidence could be obtained on an intelligence test, a performance test, an appreciation test, and on ratings.

In the main the chief finding of the more intensive analysis may be summarized as follows:

1. A smaller number of collections ($3.22 \pm .16$ as compared with $8.73 \pm .33$ collections) was reported on the individual interview than on the questionnaire.

2. There is little relationship between number of collections and chronological age.

3. "The average number of collections for boys and girls is practically identical . . ."

4. "Collecting on the whole seems to be an all-year affair."

5. Children when asked why they collect, do not know.

6. Collecting is positively related to mental age; brighter children tend to collect more things and do it better than do normal children.

7. Collecting is both a social and an individual type of activity.

8. The parent's role in stimulating collecting is passive.

"*Suggestions Coming Out of the Study.* Because of the fact that number of collections, while the easiest obtainable measure of collecting, is inadequate and because an objective score which will satisfactorily measure quality of collecting activity is difficult to obtain by group methods, the suggestion is made that fur-

ther study should be carried out by the case study method or some modification of it.

"Because collecting activity seems to be an interest especially congenial to children, it may be that greater use of it could be made in enriching the curriculum for this group in the ordinary graded school system.

"Because collecting seems to be midway between the two extremes of social and individual activities, the suggestion comes that it might be used with success in helping socially inadequate children make successful contacts with the social group."

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EDWARDS, NEWTON. *The Courts and the Public Schools: The Legal Basis of School Organization and Administration.* (Chicago: The University of Chicago Press, 1933), pp. xvi + 591.

In his preface, Dr. Edwards sets up as the two principal objectives in writing the book, first, "to make clear the fundamental principles underlying the relation of the state to education and second, to reduce to systematic organization the principles of the case or common law which are applicable to practical problems of school organization and administration." The book is to serve as a handbook for school officials and administrators and also as a textbook for advanced or graduate students of school administration.

In attaining his first aim the author has succeeded admirably. The first chapter deals with the "School and the State" in which is developed the thesis that education is a function of the state and "the maintenance of schools is an attribute of government in much the same sense as is the police power, or the power to administer justice, or to maintain the military forces, or to tax." The relations of the state and the federal government and the rights and duties of individuals in educational matters is carefully developed in terms of statutory and constitutional sanctions with due emphasis upon principles of judicial interpretation. Much stress is laid upon a clear exposition of the machinery which the state has set up in the exercise of its educational functions largely in the form of quasi-corporations, the school districts in all their varied forms, administered by school officials with their grants of power subject to the many limitations imposed upon them.

The author has recognized the necessity of the mastery of fundamental principles of administration and control and reiterates in many chapters the conception that public education is essentially and intrinsically a function of the sovereign state. This is done through the presentation of a large number of supreme court decisions carefully selected and arranged in accordance with the adopted plan of organization, which may be said to be both logical and psychological. The reader is aware, not only of the general scheme of development placed before him, but also of the many phases and problems of school law in direct relation to educational administration. This facilitates the use of the problem method of approach when the book is used as a text in the study of school law.

In his second objective, the reduction of the principles of case or common law to practical problems of school administration just mentioned above, Dr. Edwards has encountered many difficulties inherent to the subject. It is difficult to make authoritative statements when courts and jurists incline toward differ-

ent view points, or where different states have built up distinctive judicial principles. The combination of expository or "horn book" methods with case study techniques, involves one in further difficulties. On the whole the author has been very thorough and fair in his presentation of controversial material and with few exceptions, also sufficiently comprehensive, as one would expect from his experience and familiarity with the subject. He has realized the limited background of his prospective readers in matters of law and legal procedures and has ventured to present understandable definitions and principles in the field of contracts, agency, evidence, equity, torts, administrative law, etc.

On the other hand, in the presentation of case material he has quoted decisions at such length as to become wearisome to the reader who reads for exposition. At the same time for the thorough student, the quotation is inadequate and compels him to resort to the reading of the entire decision. As a text *The Courts and the Public Schools* lacks in several important particulars: (1) It should carry a complete table of cases quoted, arranged alphabetically. (2) It should have an appendix of legal terms and definitions, and (3) It should have a list of materials, such as the author once published in the *Elementary School Journal*, together with instructions for using the material, particularly that found in the digest volumes.

On the whole the book is a needed contribution in the field of school law and the citation of cases reflecting later views and practices makes the work indispensable to school officials as well as to students of the legal aspects of public school administration.

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PIERCE, ADAH. *Vocations for Women* (New York: The MacMillan Company, 1933), pp. xvi + 329.

This book on vocations was designed for the use of women in high school and college, particularly for the use of women at junior college level.

The inevitable introductory chapter is replete with generalizations such as:

"Girls of succeeding generations have been graduating from colleges all over our country with keener intellects and more perfect bodies than women have ever been known to have." (p. 3)

". . . Higher standards are required for them [women] than are required for men in similar positions. . . . Women must realize that the possibility of acquiring these standards is within the reach of all who really desire to acquire them." (p. 9)

". . . Women as a whole have so far not shown the initiative and courage necessary for progress in any vocation." (p. 9)

The body of the book consists of twenty-eight chapters dealing with as many occupations, plus one brief chapter entitled "Sciences" in which Anthropology, Astronomy, Biological Sciences, Chemistry, Geology, Mathematics, Physics, and Psychology each receive 125 to 300 words. The general plan followed by the author has been to treat each occupation from the standpoint of (1) contributions to society, (2) relations to other vocations, (3) historical development, (4) avenues within the occupation, (5) qualifications, (6) education and training required, and (7) remuneration.

The adequacy of treatment of the several occupations varies considerably, as useful information concerning certain types of work is both meager and difficult to assemble. In a large proportion

of the chapters the section devoted to the contribution of an occupation to society contains material of doubtful value to the student, or for that matter, to anyone. A single example will suffice:

"The chief contribution of pharmaceutical work to society has been that of service—distinctly service to the community." (p. 142) In the section on avenues within the occupation it is revealed that this 'service' may be rendered by (1) starting as a clerk, becoming a proprietor or manager of a unit in a chain of stores, and eventually operating or even owning a chain, (2) becoming a pharmaceutical clerk in a hospital, (3) entering upon drug manufacturing, which "can become a very remunerative business as well as a very scientific one if one has both the capital and the knowledge for conducting such a business according to modern principles of production and marketing." (p. 44).

Statements regarding qualifications required vary from those taken from the results of elaborate job-analyses to quotations typical of the "success magazines." There may be some who would disagree with the author's statement that "the chief qualifications of one who enters art . . . are:

1. Good taste which is developed through study and working repeatedly with materials.
2. Enduring physique.
3. A love of the beautiful and a desire to bring it into everyday life through creating *visual order.*" (p. 186)

Data on incomes are given for women in some occupations, including medicine, nursing, teaching, library work, social work, secretarial work, department store work, and civil service positions. For several other occupations no data are given, and the reader must be content with such statements as:

1. "Few people make much money as bankers . . . Frequently the officials of the bank do not receive a larger salary than two to three thousand dollars per year . . . The real remuneration in the banking business comes in terms of satisfaction. . . . " (p. 130)

2. "The publicity writer [elsewhere referred to as public relations counsel] is usually assured a good financial remuneration, and in addition he has the satisfaction that he is nearly always helping a cause." (p. 221)

A typographical error which places the minimum annual salary of public school principals in smaller cities at $10,000 will probably not mislead many young women. (p. 242)

The reviewer would not give the impression that the book compares unfavorably with others treating the same subject. However, comparison with a recent book on occupations for men, *The Choice of an Occupation*, by Crawford and Clement, will clearly demonstrate that Miss Pierce's volume leaves much to be desired.

The book has an index, and each chapter except the second has a brief bibliography.

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DAVIS, ELWOOD CRAIG. *Methods and Techniques Used in Surveying Health and Physical Education in City Schools.* Contributions to Education, No. 515 (New York: Bureau of Publications, Teachers College, Columbia University, 1932), pp. vii + 162.

As the title clearly implies, Dr. Davis has contributed a volume on what to look for and how to do surveys in the field of physical and health education. His book is in the nature of a research problem solved intelligently by the jury

method and readers will find much of value from the consensus of opinions expressed. Principally, however, the material gives to the reader an enhanced respect for the breadth of this field and school administrators will find many valuable suggestions for appraising their own programs. No pretense is made, of course, at establishing standards for local city programs but for one who would not recognize a good program of health service, health instruction, or physical education if and when he saw one, Dr. Davis' contribution will point clearly to those observation points where informative data may be obtained.

The book is arranged in six chapters: including, in addition to the introduction and summary, a section on the development of survey techniques with an evaluation of existing surveys, two sections on general methods of surveying in physical and health education, and one on the duties of surveyors and the construction of forms to be used. The appendices are singularly valuable inasmuch as they provide a topical outline of all observation points and also reproduce the actual forms used in the Fort Worth, Texas, survey.

Physical and health education is a broad curriculum. Its breadth can be appreciated clearly if one starts out to survey the program in any one school or system. Thankfully, the last fifteen years have seen a healthy growth beyond exercise for the mass and athletics for the few. It may be that we can look forward to a future of high development in this field and, if so, Dr. Davis' study will be a useful device in checking the programs for completeness. The book will be of use to teachers, supervisors, directors of physical and health education; to principals and superintendents; and to surveyors; and can be listed as one of the more useful types of doctoral dissertations.

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RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

BACON, SAMUEL FREDERICK. *An Evaluation of the Philosophy and Pedagogy of Ethical Culture*, Doctor's Dissertation (Washington: The Catholic University of America, 1933), viii + 182 pp.

This study attempts to appraise the educational work of the ethical culture movement from the standpoint of the principles of Catholic education. The bulletin contains a discussion of ideas of the world and life in ethical culture; ideas of man and human nature in ethical culture; morality and ethical ideal; development of character in the pedagogy of ethical culture; influence of character; effectiveness of ethical rule; demanding God; the help of religion; an evaluation of ethical culture; the value of the ideal of a reformer; idealism in education; results of ethical culture training; and conclusion. Bibliography.

BAKER, HARRY J., LELAND, BERNICE. *In Behalf of Non-Readers* (Bloomington, Illinois: Public School Publishing Company, 1934), 39 pp.

This bulletin contains a statement of the problem; definitions and procedures; case records of symptomatic behavior; case records of symptons, sources, and diagnosis; case records of remedy and results; and mental hygiene and inability to read. References.

BALLOU, WILLARD ALGER. *A Comparative Study of State Teachers College and Liberal Arts College Faculties*, Doctor's Dissertation (Philadelphia, Pennsylvania: University of Pennsylvania, 1933), xiii + 78 pp.

Calling attention to the fact that 25 percent of all students being educated in institutions of higher learning in this country are in teachers colleges and normal schools, the author discusses the social status, economic status, professional status, and other aspects of state teachers college faculties and liberal arts college faculties. Bibliography.

Beswick, J.C. *Instructional Analysis of Police Service*, Department of Education Bulletin, No. 3 (Sacramento, California: California State Printing Office, 1934), viii + 190 pp.

This bulletin presents a job analysis of police service. It contains a list of duties performed by the policemen in the various divisions of police work, and a statement of the knowledge required in performing these duties. The duties have been listed in the best instructional order.

CHAMBERLAIN, LEO M. *Measures of Educational Performance in the County School Districts of Kentucky*, Bulletin of the Bureau of School Service (Lexington, Kentucky: College of Education, University of Kentucky, 1934), 42 pp.

The purpose of this investigation was to develop a series of measures to be employed in the comparison of the performance of the county school systems of the state as accurately as possible, and to interpret these performance measures in terms of ability to support education. The bulletin contains three chapters: the measures of performance; the measures of ability; and the rank of the counties on performance, ability, and effort.

COLLMANN, R. D., MARSHALL, A. J., AND THOMAS, R. *Comparative Intelligence of English, American and Australian Children*, Educational Research Series, No. 22 (Melbourne, Australia: Melbourne University Press, 1934), 70 pp.

The three investigations reported in this volume were carried out with the aid of a grant from the Australian Council for Educational Research. There are three papers: Comparison of intelligence of Victorian and American school children; the standardization of Spearman's "Measure of Intelligence" for Perth, Western Australia; and the standardization for Perth, W. A., of the Sydney Teachers' College Group Scale.

CUNNINGHAM, K. S., AND PRICE, W. T. *The Standardization of an Australian Arithmetic Test*, Educational Research Series, No. 21 (Melbourne, Australia: Melbourne University Press, 1934), 116 pp.

This bulletin contains a description of the procedure employed in the standardization of an Australian arithmetic test: selection of schools, pupils, analysis of results, intercorrelations, summary, etc.

FRANCIS, KENNETH V., AND FILLMORE, EVA A. *The Influence of Environment upon the Personality of Children*, University of Iowa Studies in Child Welfare, New Series No. 274 (Iowa City: University of Iowa, 1934), 71 pp.

After reviewing the methods of study employed in this investigation, the authors discuss the community background, the environmental conditions, personality in relation to environment, etc. Observational forms, questionnaires, tests, are reproduced in the appendix.

GANDY, ROXANA S. *A Comparison of Certain Social Experiences of Third Grade Urban and Rural Children*, Doctor's Dissertation (Philadelphia, Pennsylvania: University of Pennsylvania, 1933), 119 pp.

Calling attention to the importance of environment and individual development, the author states the purpose of the investigation, the construction of social experience test, comparison of urban and rural groups, with a summary and conclusions. Bibliography.

HAGGERTY, M. E., AND OTHERS. *Studies in College Examinations*: An Experimental Investigation in the Construction and Use of College Examinations Minneapolis, Minnesota: Committee on Educational Research, University of Minnesota, 1934), vii + 204 pp.

This bulletin presents a summary of a number of investigations relating to college examinations; differential functions of examinations; measuring the achievement of objectives in freshman English; testing the understanding of ideas; measuring the ability to apply information; individual diagnosis; consistency of student performance; essay and objective examinations in English literature; measured gains in psychology, etc.

HOLMSTEDT, RALEIGH WARREN. *Factors Affecting the Organization of School*

Attendance Units, Bulletin of the School of Education, No. 3 (Bloomington, Indiana: School of Education, Indiana University, 1934), 32 pp.

This bulletin contains a discussion of size of school, transportation, density of population, rural and urban school units, the school township, the county unit, and summary.

HOY, ALICE. *The Teaching of History and Civics in Victorian Secondary Schools*, Educational Research Series, No. 23 (Melbourne, Australia: Melbourne University Press, 1934), 78 pp.

The purpose of this investigation was to find out on the one hand the existing practice in these subjects, the programs used, methods of study, equipment, etc., and on the other hand the views which thoughtful teachers hold as to the adequacy of the prevailing system or the changes in it deemed advisable. The discussion is presented in three chapters: the teaching of history in Victoria; the teachers' views; and civics.

JONES, EDWARD S., AND OTHERS. *Studies in Articulation of High School and College*, The University of Buffalo Studies, IX (Buffalo, New York: University of Buffalo, 1934), xiii + 319 pp.

The authors discuss the articulation of the several units of the American educational system from three points of view: nature of the superior student; prediction of college performance; and measuring overlapping between high school and college.

OBRIEN, F.P. *Economics Possible in Larger School Units*, Kansas Studies in Education, No. 3 (Kansas City, Kansas: Bureau of School Service and Research, University of Kansas, 1934), 29 pp.

With the economic crisis of 1929 as the background, the author discusses possibilities of economies possible in large school units, with special reference to the State of Kansas. He offers a number of suggestions for sane economy.

PHELAN, ANETTE M. *A Study of School Health Standards* (Menasha, Wisconsin: George Banta Publishing Company, 1934), ix + 249 pp.

This investigation presents a study of working standards for a school health program. The bulletin contains a statement of the problem, a review of the literature on school health, standards related to health service by professional and lay workers, the hygiene of the school plant, standards related to classification of children and special education, standards related to other school health problems, and a summary of the examination of individual standards. Bibliography.

POTTER, GLADYS L. *Motion Picture Appreciation in the Elementary School*, Department of Education Bulletin, No. 9 (Sacramento, California: California State Printing Office, 1934), vii + 37 pp.

This bulletin contains a discussion of the influence of the motion picture, recent studies relative to the motion picture, educational possibilities in the motion pictures, the responsibility of the teacher, and suggestions to the teacher: photography, making a screen play, tone values, documentary films, costumes and make-up, music, sets, and bibliographical notes.

THOMAS, DOROTHY SWAINE, LOOMIS, ALICE M., AND ARRINGTON, RUTH E. *Observational Studies of Social Behav-*

ior, I (New Haven, Connecticut: Institute of Human Relations, Yale University, 1933), xvii + 271 pp.

This bulletin presents the results of the use of the observational technique in the study of social behavior: Part I, techniques, and results, and Part II, aspects of observer reliability. Illustrative blanks and forms are given in the appendix.

WELLMAN, BETH L., AND OTHERS. *Manual of Nursery School Practice*, Bulletin of the State University of Iowa, New Series No. 730 (Iowa City: State University of Iowa, 1934), 215 pp.

This manual contains a discussion of the child in the nursery school, his surroundings, his health, his safety, relationship with other persons, play, art, music, language, speech, and many other phases of nursery school education. Bibliography.

METHODS OF CLASSROOM INSTRUCTION

GROSSNICKLE, FOSTER E. "An Experiment with a One-Figure Divisor in Short and Long Division. I and II," *Elementary School Journal*, XXXIV (March, April, 1934), pp. 496-506; 590-599.

An experimental study with a one-figure divisor in short and long division from which the author concludes that the long division form is superior to the short division form for a one-figure divisor.

HARRISON, M. LUCILE. "The Nature and Development of Concepts of Time among Young Children," *Elementary School Journal*, XXXIV (March, 1934), pp. 507-514.

A discussion of the concept of time with data on certain concepts of primary school children.

PIERCE, PAUL R., AND QUINN, HELEN J. "A Study of Certain Types of Work Materials in First-Grade Reading," *Elementary School Journal*, XXXIV (April, 1934), pp. 600-606.

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WITTY, PAUL A. "Diagnosis and Remedial Treatment of Reading Difficulties in the Secondary School," *Educational Trends, III* (April, 1934), pp. 7-13.

The author presents an analysis of the reading of 50 ninth-grade children examined in the Educational Clinic of Northwestern University. Lists of difficulties and causes are given.

WOLFLE, DAEL L. "The Role of Generalization in Language," *British Journal of Psychology*, XXIV (April, 1934), pp. 434-444.

The author discusses sound symbolism, word meaning, and analogic change concluding that all three are forms of the process of generalization.

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HARAP, HENRY, AND MAPES, CHARLOTTE E. "The Learning of Fundamentals in an Arithmetic Activity Program," *Elementary School Journal*, XXXIV (March, 1934), pp. 515-525.

The authors present the results of an experimental study of an arithmetic activity program based upon real situations

from which they conclude that the basic arithmetic steps can be so mastered.

UNZICKER, SAMUEL P. "Trait Actions of Junior High School Citizens," *School Review*, XLII (April, 1934), pp. 272-282.

After presenting a list of traits deemed important in junior high-school citizenship, the author presents for each of ten major groups of traits a number of trait actions.

CHILD WELFARE, GUIDANCE AND DEVELOPMENT

LORGE, IRVING, AND METCALFE, ZAIDA F. "The Prediction of Some Measures of Vocational Adjustment on the Basis of Tests Given Eight Years before and of the Same Tests Given Two Years after the Fact Predicted," *Journal of Educational Psychology*, XXV (March, 1934), pp. 220-224.

The authors report the results of retests of 140 boys after ten years and find that the tests have little predictive value.

MEASUREMENTS, STATISTICS, AND METHODOLOGY OF SCIENTIFIC RESEARCH

CLAPAREDE, ED. "La Genese De L'Hypothese," *Archives de Psychologie*, XXIV (June-September, 1933), pp. 1-154.

The author reports herein an extended discussion and experimental data relating to hypothetical thinking: Part I, the nature of intelligence; Part II, researches relating to the genesis of hypothetical thinking.

DEWEY, JOSEPH C. "Consistency of Pupil Response on Tests of Reading Comprehension," *Elementary School Journal*, XXXIV (March, 1934), pp. 533-536.

From an analysis of the results of six different sorts of comprehension tests covering two reading sections in American history given to 55 eighth-grade pupils, the author suggests, due to the problem of verbalism, the need for greater care in the preparation of evaluation and the interpretation of tests of reading comprehension.

DICKEY, JOHN W. "On Estimating the Reliability Coefficient," *Journal of Applied Psychology*, XVIII (February, 1934), pp. 103-115.

The author offers a critical discussion of Kelley's formula for estimating the reliability of a test from one range, when the reliability of this test is known for another range.

DOUGLASS, HARL R. "Some Observations and Data on Certain Methods of Measuring the Predictive Significance of the Pearson Product-Moment Coefficient of Correlation," *Journal of Educational Psychology*, XXV (March, 1934), pp. 225-232.

The author discusses and illustrates a number of errors frequently made in the use of the coefficient of correlation.

FAY, PAUL J., AND MIDDLETON, WARREN C. "An Economical Method of Administering and Scoring New-Type Examinations," *Journal of Applied Psychology*, XVIII (February, 1934), pp. 77-84.

The authors describe an inexpensive method of administering and scoring new-type examinations.

LEE, J. MURRAY, AND SYMONDS, PERCIVAL M. "New Type or Objective Tests:

A Summary of Recent Investigations (October, 1931-October, 1933)," *Journal of Educational Psychology*, XXV (March, 1934), pp. 161-184.

The authors present a summary of recent investigations relating to the new-type or objective test, discussing the teaching values of new-type tests, validity, reliability, scoring methods, indeterminate items, oral versus printed tests, students' attitude, new types of tests, etc. Bibliography.

MOORE, HERBERT, AND TRAFTON, HELEN. "Equating Test Scores," *Journal of Educational Psychology*, XXV (March, 1934), pp. 216-219.

The authors give the range, medians, and intercorrelations for Terman, Army Alpha, Miller, Otis, and other tests of intelligence.

VOTAW, DAVID F. "Notes on Validation of Test Items by Comparison of Widely Spaced Groups," *Journal of Educational Psychology*, XXV (March, 1934), pp. 185-191.

The author discusses the conventional method of validating test items by the comparison of the percent of correct responses of the two extremes of the population employed for this purpose and proposes a new method for choosing test items.

MISCELLANEOUS

TRYON, ROLLA M. "One Hundred Years of History in the Secondary Schools of the United States," *School Review*, XLII (February, 1934), pp. 93-103.

The author traces the history of history as a secondary school subject concluding that better results might accrue if history were given a chance as a school subject.

NEW TESTS

CORNELL, ETHEL L., AND COXE, WARREN W. *Cornell-Coxe Performance Ability Scale*. Yonkers-on-Hudson, New York: World Book Company, 1934.

This scale consists of a series of performance tests designed to measure intelligence by non-verbal means, constructed for testing backward children and adults, or for discovering special aptitudes of normal children.

LAZERTE, M. E. *Lazerte Diagnostic Problem-Solving Tests in Arithmetic*, Grades III to VII. Toronto, Canada: Clarke, Irwin and Company, 1934.

There are two tests for each of the grades from III to VII, inclusive. Test 1 for each grade was designed to measure the ability of pupils to derive answers to printed problems; and Test 2 consists of test items constructed to diagnose problem-solving deficiencies.

HILDRETH, GERTRUDE H., AND GRIFFITHS, NELLIE L. *Metropolitan Readiness Tests:* for Kindergarten and Grade I. Yonkers-on-Hudson, New York: World Book Company, 1933.

The purpose of this test is to measure the "readiness" of kindergarten and first grade pupils to do first grade work.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

SELECTED BIBLIOGRAPHY ON TECHNIQUES OF EDUCATIONAL RESEARCH AND RELATED PROBLEMS, 1933-34

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THIS is the fifth annual bibliography on research techniques to be published in the *Journal of Educational Research*. It covers the period from approximately July 1, 1933, to July 1, 1934. The earlier bibliographies may be found in the issues for October, 1930; September, 1931; October, 1932; and September, 1933.

The writing of the past twelve months includes evaluations of educational research and scientific method in relation to a wide variety of fields and problems: the educational crisis, the state department of education, higher education, the elementary school, elementary science teaching, the curriculm, English, the social studies curriculum, philosophy, sociology, educational measurement, personality measurement, investigational procedures, statistical data, guidance, supervision, and the new or progressive education.

Certain authors have attempted to trace the trends of the past, in some instances covering as much as a century, in such areas as: education, psychology, the social order, history in secondary schools of the United States, student personnel research, and research in English.

A few bolder spirits with a certain gift of imagination have predicted future trends in school administration, educational reforms, school research, and higher education.

Of especial value by way of stimulus to field workers interested in research, to graduate students, and to staff members of higher institutions are the discussions of the past year which point out needed research in the areas of: progressive education, secondary education, higher education, education in general, school organization, supervision, guidance, comparative education, educational measurement, business education, and home economics.

A subdivision of the present group of references includes evidence of the remarkable development of bibliographical and summarizing aids for the benefit of the worker in educational research. The selected monthly lists of references in the *School Review* and *Elementary School Journal* cover areas of especial significance for field workers. The bibliographical summaries of research in the *Review of Educational Research* and *Psychological Bulletin* include most of the important fields of education and psychology. An annual bulletin of the United States Office of Education lists graduate theses completed in education, and *School and Society* prints an annual list of educational books, monographs, and bulletins. There are represented in the present

bibliography abstract volumes of graduate theses, lists of theses completed and under way, and bibliographies in special fields. Certain journals, especially in subject-matter fields such as health and physical education, chemical education, modern language, and sociology, prepare annual lists of research studies or theses completed.

Another section of this bibliography includes the writing of the past year on various procedures for collecting, analyzing, and interpreting data: historical research, experimentation, surveys, testing and measurement, statistics, interviews, questionnairies, case work, logic, etc.

The last group of references deals with various aspects of the training and guidance of research workers and graduate students: library usage, training programs for given types of school workers, requirements for graduate degrees, place of research in the training of graduate students, relation between research and teaching activities, work of bureaus of research, and rating of graduate departments of instruction. The report of the Committee on Graduate Instruction of the American Council on Education, which includes lists of universities judged competent to offer doctorate work in the various fields of learning, has attracted a great deal of attention since its publication in April, 1934. Psychologists have been especially interested in a recent survey of practices in granting the Doctor's degree in their field.

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Brim, O.G. "Orientation of Educational Research to Present-Day Science and Philosophy," *Educational Research Bulletin*, XIII (February 14, 1934), 29-38, 54.

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Charters, W.W. "Practical Research," *Educational Research Bulletin*, XII (October, 1933), 215-16.

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